

Iris, a 28-foot hydroplane owned by Thomas Knight, of Toronto. The hull is of the three-skin type and a 250 h.p. Sterling motor drives it at a speed of nearly 45 miles per hour. A 26.38-inch Hyde propeller is used.

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December, 1916

MOTOR BOATING

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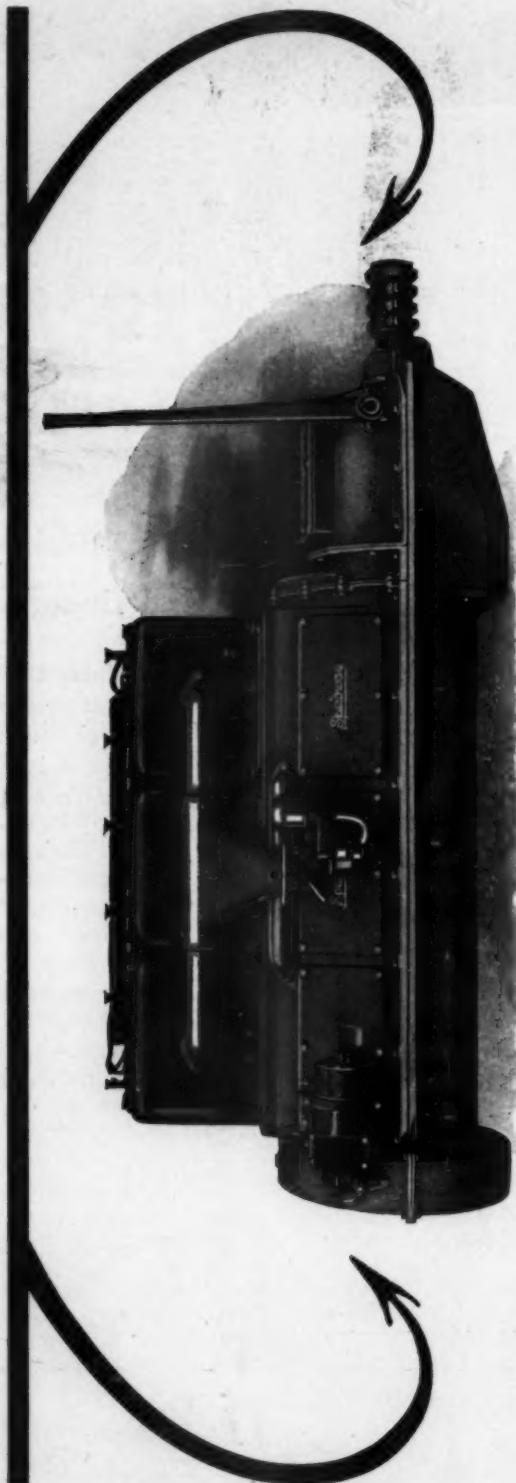
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MORRIS HEIGHTS

NEW YORK CITY

WRITE TO US FOR DETAILS OF OUR YACHTS, LAUNCHES AND MOTORS.



Emoh III, an express cruiser recently launched on Long Island Sound. She was designed by Frederick K.

Lord, built by the Greenport Basin & Construction Co., and is powered with an eight-cylinder 200 h. p. Van Blerck motor

Foreign Business Increases Fivefold

American Motor Boats and Engines in Great Demand in Foreign Markets—A Well Balanced Distribution Among Countries in All Parts of the World

By Dr. Edward Ewing Pratt
Chief of Bureau of Foreign & Domestic Commerce

So far as foreign trade is concerned, American manufacturers of motor boats and internal combustion marine engines have been slow to benefit from the abnormal conditions of the last two years, and it is probably accurate to say that this state of affairs is due to the fact that motor boats are largely used for pleasure purposes. Brazil, Canada, Mexico, and England were among the chief purchasers of pleasure craft in normal years, and in these countries, as well as in every other country, there has been recently a necessity for retrenchment.

Nevertheless, the exports in 1916 were greater than ever before. The total value of American motor boats sold abroad was \$800,231, which is somewhat greater than the previous record. But in gasoline marine engines the previous high mark was doubled, the new figure being \$3,139,955. Considering the excellence of the American product and the world-wide popularity of boats propelled by motors, this is not a very imposing total, but it is large enough to warrant a careful study.

The one outstanding feature of the year's trade was the sudden demand from Russia. Prior to the war the total busi-

ness with that country had amounted to some \$50,000 worth of engines a year. In 1916, motor boats to the value of \$547,158 were sold to Russian buyers and \$439,881 worth of gasoline engines for boats. This is a remarkable increase, and it is safe to conclude that only a small proportion of these purchases will be used for pleasure purposes. An important part of these exports went to Russia by way of Vladivostok. In May, 1916, two consignments of engines valued at \$118,100 went by this route, and in June they were followed by nine more, valued at \$230,000.

The character of the demand from Canada has also undergone a striking change. Orders for motor boats in 1916 amounted to only \$10,569, as compared with normal orders ranging from \$40,000 to \$70,000, but orders for gasoline marine engines jumped from an average of some \$300,000 to \$1,780,873. It would not be safe to assert that these engines are all intended for pleasure craft.

Shipments to countries where motor boats are used largely or wholly for pleasure were still far below normal in 1916, but there was an increase to most countries as compared with 1915. A little study of the accompanying tables will make

clear what has been happening to our foreign trade during the last three years. The lower table shows the principal purchasers of American motor boats in 1914, 1915, and 1916, and the upper one the principal purchasers of gasoline marine engines for the same years.

The Russian sales are the most significant feature of the year's business, not only because of the considerable money involved, but also because they should be an open sesame to the Russian market of the future. If we give satisfaction at this time, American boats and engines will have established a reputation that will be a most valuable asset in years to come. All indications point to a great revival in Russia once the war is over, and I have no hesitation in saying that the Russian market can be made the most attractive in the world to American manufacturers. There is the best feeling between the two peoples.

As has been stated, some of our marine motors are being delivered at Vladivostok, and this brings up the subject of Asiatic markets for boats and motors. It would be impossible in one article of this kind to sketch the possibilities of every market in the world, so I am going to confine myself largely to Asia. There is something attractive in the idea of selling Yankee devices to the natives of the East, especially to the Chinese. It will be many years before the roads of China will be in condition to encourage the use of automobiles, but the canals, rivers, bays, and the waters of the Pacific are ready now for a peaceful invasion of motor boats and engines of American manufacture.

Our commercial attaché at Peking, Julean Arnold, has recently reported that there should be a good opportunity for the sale of American outboard motors in connection with inland water transportation in China, provided American manufacturers can furnish a 5 h.p. motor capable of operating with crude petroleum. A Swedish motor of this description has already appeared and it will be necessary for American manufacturers to step lively. An American business man in China states that there are probably 8,000 owners of native craft in one section that could be induced to buy low-priced motors operating with petroleum or at least kerosene. Gasoline sells at a much higher price than in America and for that reason it is difficult to find a market for gasoline motors, for the present at any rate.

There are about a dozen marine motors in the vicinity of Amoy, so it may be taken for granted that the natives are more or less familiar with their advantages. Most of the local traffic is carried by sailboats, which in many respects are not at all satisfactory. A good demonstration agent, and an established agency, will undoubtedly bring good results here. There is not a mile of roadway in the Amoy district suitable for wheeled traffic. River boats and coolie caravans carry all goods. There is sure to be an awakening in this district before long, for there are immense mineral resources. As soon as the war is over and capital can be had, things will go ahead.

In 1915 a motor boat equipped with American kerosene engines ran from Hongkong to Swatow, a distance of 180 miles, in thirty-one hours. This boat was 60 feet long, 12 feet in beam, with a mean draft of only 9 inches. The hull was constructed by a Chinese firm in Hongkong under the

direction of the representatives of an American company. It will carry 100 passengers. Two three-cylinder kerosene motors drive it at a speed of 7½ knots. This is the type of boat and engine wanted here. The engines have behaved splendidly.

There is no end to the motors that can be sold in China in the next twenty-five years, and there is no reason to suppose that the American product will not hold its own in competition with all others. The principal point to remember in selling such articles to the Chinese is that demonstration on the ground is the surest way to make sales. The native wants to see what he is going to buy, and wants to see it work satisfactorily.

In Japan marine motors have been used chiefly on passenger and fishing boats. These are, as a rule, heavy-duty, slow-speed, moderate-powered engines burning chiefly kerosene or producer gas. The Japanese were quick to see the advantages of motors for commercial purposes on the rivers and canals of the larger cities, but they have been slow to take up motor boating for pleasure. A few Japanese in Tokyo have equipped launches, built on racing lines, with American motors, but it cannot be said that much enthusiasm has been aroused in this sport to date. There is an undoubtedly opportunity to build up a profitable business in this line, however.

Most of the marine motors in use in Japan are to be found in the fishing trade. They are not used on the fishing boats themselves, but on the boats that go from port to port collecting fish. These motors are usually slow-speed, heavy-duty affairs, two-cycle, with one or two cylinders, and from 20 to 50 b.h.p. They are mostly of Japanese or European make, and burn kerosene or producer gas. Japanese makes are now in competition with the German, Swedish, and English motors that have long dominated the market and seem able to hold their own. No small, high-speed gasoline motors are made in Japan.

A most interesting account of a motor boat race in Bangkok, Siam, has recently been sent us by Vice-Consul Carl G. Hansen. Somehow it is rather difficult to conceive of such sport in Siam, but there is no getting away from the facts. Most of the craft entered in this contest were rowboats equipped with outboard motors from the United States. The race was arranged for by the harbor master of Bangkok, and 5 h.p. motors were placed in Class 1, 3 h.p. motors in Class 2, and 2 h.p. motors in Class 3. Twenty boats took part in the sport. In Class 1, a boat equipped with an American motor finished second, while in Classes 2 and 3 American motors finished one, two, three. I cannot overlook this opportunity to point out that an American concern placed in touch with a Bangkok house by the Bureau of Foreign and Domestic Commerce succeeded in selling several outboard motors at once and has since received an additional order for thirty-six more. The sale of outboard motors should lead to a demand for more expensive types, and it is safe to say that the

Principal Purchasers of American Gasoline Marine Motors in 1914, 1915 and 1916

Principal purchasing countries	Fiscal year 1914	Fiscal year 1915	Fiscal year 1916
Russia	\$51,599	\$20,150	\$439,881
Austria-Hungary	15,967	3,097	.....
Belgium	21,206	1,472	.....
Denmark	31,273	8,710	15,086
Finland	41,473	3,824	1,641
France	22,332	8,661	6,620
Germany	70,964	2,557	.....
Italy	23,749	9,072	83,978
Netherlands	45,556	16,387	34,288
Norway	57,368	29,608	55,859
Sweden	64,526	8,964	40,573
England	92,096	64,189	227,643
Canada	302,391	147,730	1,780,873
Panama	6,092	12,080	4,804
Mexico	38,902	13,193	30,255
Newfoundland and Labrador	103,895	65,127	81,911
Cuba	30,393	29,027	26,344
Argentina	70,058	11,327	14,101
Brazil	62,882	17,428	25,862
Ecuador	10,636	11,185	2,178
Peru	14,835	5,052	8,537
China	19,330	8,280	7,618
British India	12,532	18,208	15,679
Japan	16,466	3,548	8,386
Australia	150,214	85,517	96,498
New Zealand	21,583	20,338	20,648
South Africa	15,394	12,134	13,897
Total	\$1,413,712	\$636,865	\$3,043,760

Principal Purchasers of American Motor Boats in 1914, 1915 and 1916

Principal purchasing countries	Fiscal year 1914	Fiscal year 1915	Fiscal year 1916
Russia	\$6,933	.....	\$547,158
Norway	4,400	.....	4,815
England	92,096	\$64,189	227,643
Canada	39,045	23,387	10,569
Panama	52,553	14,184	26,243
Mexico	123,545	115,516	16,593
British W. Indies	5,430	410	12,990
Cuba	18,539	6,724	20,556
Brazil	13,518	2,209	7,136
Colombia	96,417	26,810	5,482
Peru	12,844	14,901	6,914
Total	\$465,320	\$268,330	\$886,099

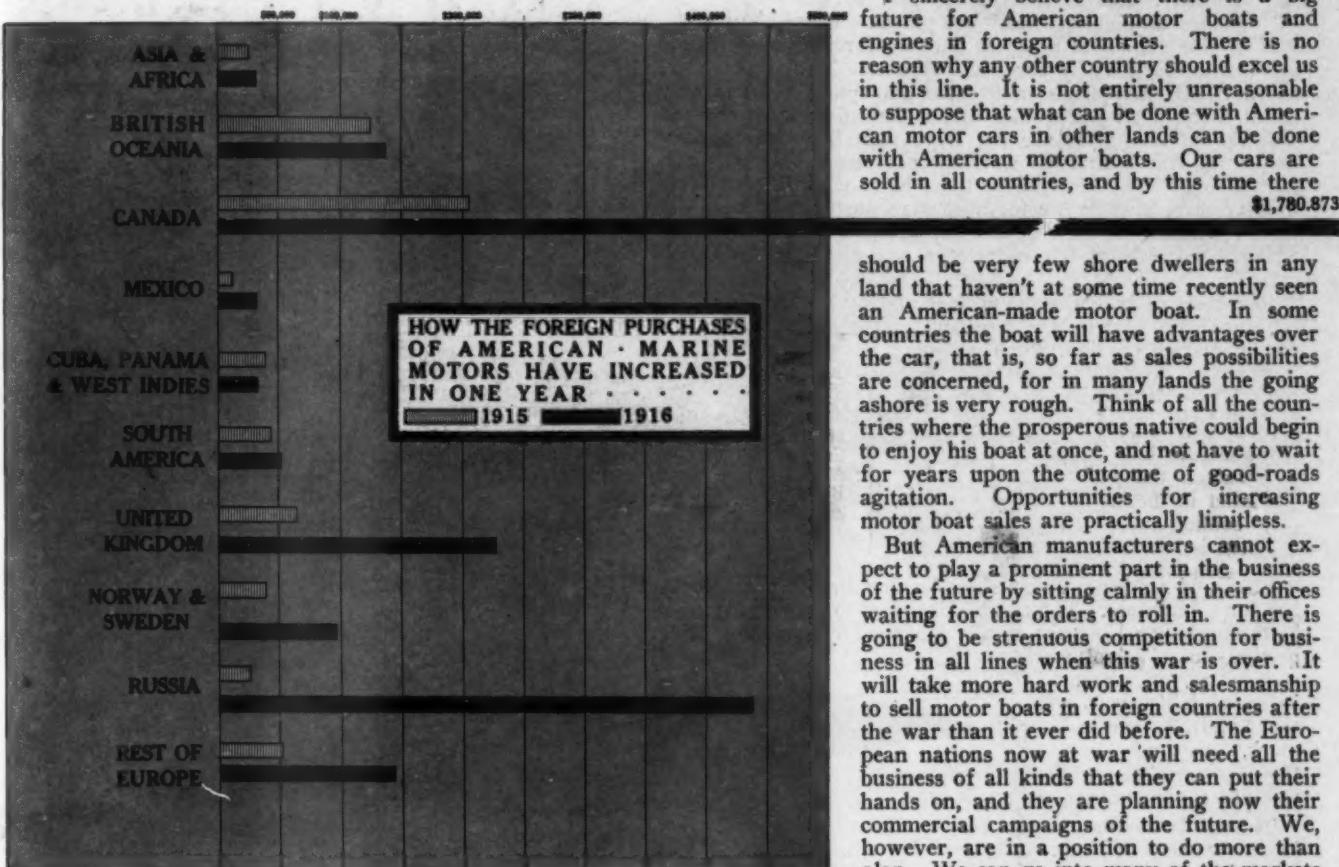
¹ It should be noted that the exports to Brazil were valued at \$286,589 in 1912 and \$366,983 in 1913.

excellent reputation already established for the low-priced American motors now in use will be a distinct advantage to American manufacturers in the future.

The consul at Karachi, India, has communicated the interesting information that the Persian Gulf region will be a likely market for American motor boats and engines when the war

is over. Such products are at present, of course, contraband of war, and the consul is not at liberty to assist in any way in selling them in belligerent countries or their colonies, but if catalogues and price lists are sent to the consulate at once they will be ready for use as soon as peace is declared.

This brings up the question of the best method of entering the Asiatic field. Some good business is sure to result from



an intelligent use of catalogues and well placed newspaper and magazine advertising, to say nothing of making the most of the facilities the Government has placed at your disposal, but if we are to get the share of the business we really ought to have, in the face of the most active competition, it seems to me that the wisest course is to send over competent men to make a survey of the field, arrange for permanent agencies, and reach some decision as to credits. And the time to send such men is now. The smaller manufacturer can probably do as well through the export commission houses as in any other way.

Of course, Asia is not the only promising field. There is Europe itself, and South Africa, Australia, the West Indies,

Central America, and always South America. Our Latin-American neighbors will probably demand more pleasure craft when the war is over than they did before, and it should be borne in mind that there is nothing too good for a certain proportion of the populations to the south of us. They demand the best houses, the best horses, the best automobiles, and they will demand the best there is in the way of pleasure craft.

I sincerely believe that there is a big future for American motor boats and engines in foreign countries. There is no reason why any other country should excel us in this line. It is not entirely unreasonable to suppose that what can be done with American motor cars in other lands can be done with American motor boats. Our cars are sold in all countries, and by this time there

\$1,780,873

should be very few shore dwellers in any land that haven't at some time recently seen an American-made motor boat. In some countries the boat will have advantages over the car, that is, so far as sales possibilities are concerned, for in many lands the going ashore is very rough. Think of all the countries where the prosperous native could begin to enjoy his boat at once, and not have to wait for years upon the outcome of good-roads agitation. Opportunities for increasing motor boat sales are practically limitless.

But American manufacturers cannot expect to play a prominent part in the business of the future by sitting calmly in their offices waiting for the orders to roll in. There is going to be strenuous competition for business in all lines when this war is over. It will take more hard work and salesmanship to sell motor boats in foreign countries after the war than it ever did before. The European nations now at war will need all the business of all kinds that they can put their hands on, and they are planning now their commercial campaigns of the future. We, however, are in a position to do more than plan. We can go into many of the markets and win a place for our goods. Shipping

facilities are not all that we could wish, but we can make more deliveries than our competitors. And deliveries of such articles as motor boats at this time will mean much in the future. What we need most is a fair trial of our best lines, and now is the time to have them tried. We cannot afford to overlook a single order at this time.

I do not believe that our exports of motor boats and engines will fall back to the old level when peace is made. Undoubtedly many of the biggest shipments at the present time have resulted from war conditions, but these orders should be looked upon as an entering wedge. If they give satisfaction, it will add greatly to our prestige. Upon the satisfaction we give at the present time will depend largely our future success.



A 60 x 10-foot patrol boat built by the Greenport Basin and Construction Co., of which a large number have been exported during 1916

The Wonderful

By Henry Woodhouse

Member, Board of Governors, Aero Club of America;
Director, American Society of Aeronautic Engineers;
Educational and Industrial Delegate, Pan-American
Aeronautic Federation

FIIFTY million dollars is to be spent in the United States in the coming year for aeroplanes and aeronautical equipment. More than half of this sum is to be spent here by foreign countries for aeroplanes, particularly for war purposes. To-day there are about 20,000 aeroplanes in use for war purposes, and only about forty or fifty machines in use for utilitarian purposes. The reason that there are not more than 20,000 aeroplanes in use for war is that the warring countries cannot get them fast enough. The reason why there are not more than forty or fifty aeroplanes in use for utilitarian purposes is that little attention has been paid to applying the aeroplane to solving problems of transportation and intercommunication.

Seaplanes of both the flying boat and hydroaeroplane type are employed by the thousand in the present war for submarine chasing, bomb dropping, coast patrol, convoying of troops and reconnoitering. There is nothing that can deal so efficiently with submarines as seaplanes. The submarine can be detected from an aeroplane flying at between 500 and 1,000 feet, even when the former is submerged under thirty feet of water. The seaplane circles until the submarine rises, then drops a bomb or shoots at it with the aeroplane gun.

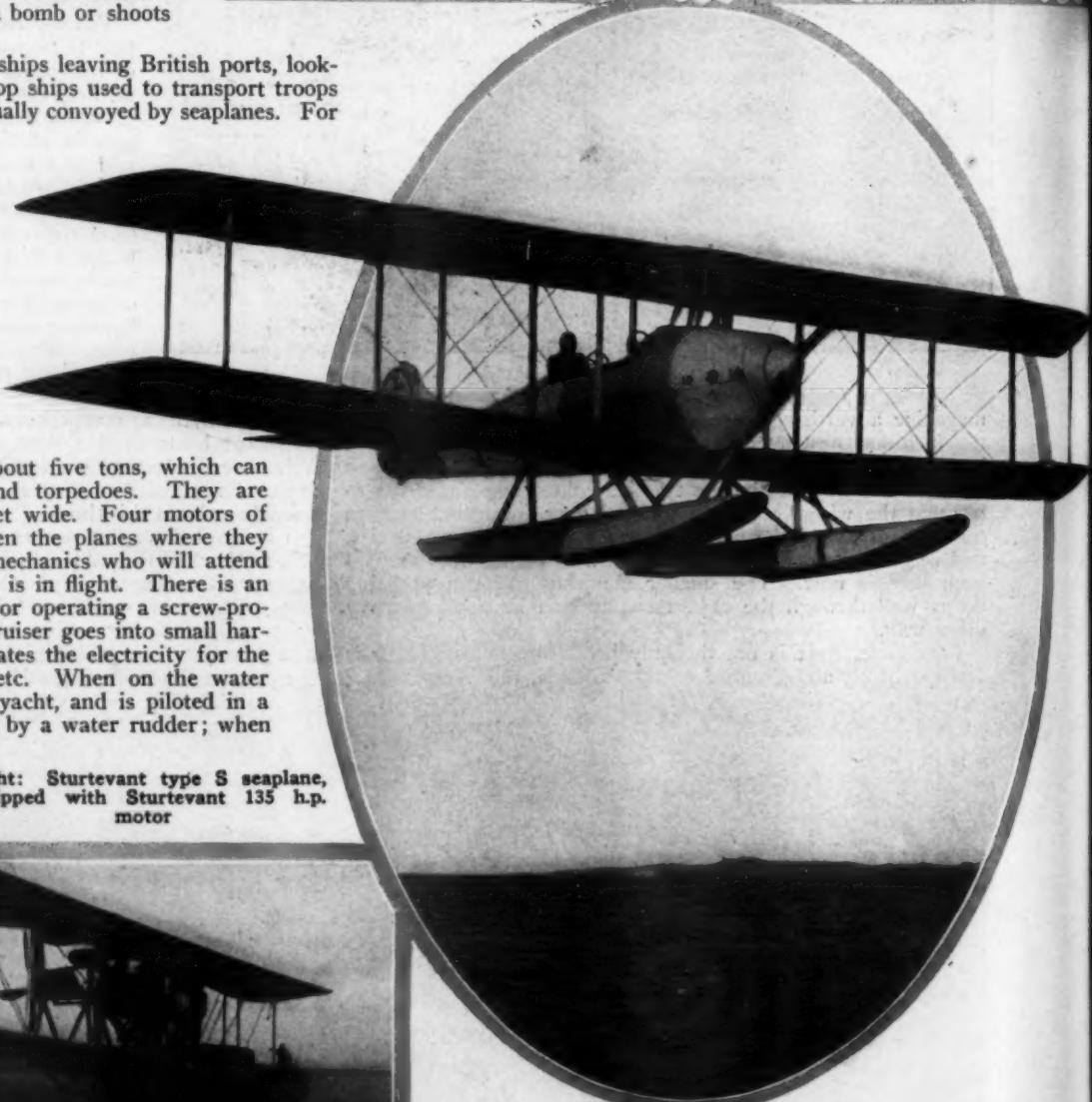
Flocks of seaplanes escort ships leaving British ports, looking for submarines. The troop ships used to transport troops by the fighting nations are usually convoyed by seaplanes. For general coast patrol work a seaplane, on account of its speed, which goes up to the hundred mile-an-hour mark, displaces two or three cruisers, doing their work at a great saving.

The seaplanes used range in power from 150 h.p. to 1,200 h.p. and cost from \$10,000 to \$50,000 each. The latter are just being tested and are American-made. Their carrying capacity in useful load is about five tons, which can be passengers—or bombs and torpedoes. They are triplanes, with wings 133 feet wide. Four motors of 300 h.p. are mounted between the planes where they are easily accessible to the mechanics who will attend to them while the air cruiser is in flight. There is an additional motor of 80 h.p. for operating a screw-propeller for use when the air cruiser goes into small harbors. This motor also generates the electricity for the electric lights, self-starters, etc. When on the water this giant seaplane is like a yacht, and is piloted in a similar way, being controlled by a water rudder; when

Right: Sturtevant type S seaplane, equipped with Sturtevant 135 h.p. motor



Left: Curtiss air cruiser in the service of the British Admiralty, equipped with three 160 h.p. Curtiss motors



Curse of the Flying Boat



Christofferson flying boat

ard inconceivable except by the employment of aircraft. It means transportation from the point of shipping to the point of delivery without any unloading again and again from railroad to ship and from ship to railroad, and from railroad to railroad, as is now the case with most of the long distance shipping. It will mean, for instance, transportation from Pittsburgh to Petrograd without unloading and reshipping on the way—and at all seasons. And innumerable air lines between North and South America and between different points in South and Central America, where aircraft are destined to solve difficult problems of transportation.

How soon will that come? Let us say ten years—though, at heart we must admit that if progress in aeroplane construction

continues to be as fast as it has been in the past three years, we shall find in another five years that we actually were conservative in setting the date for the advent of transatlantic aerial transportation as a decade hence.

Let us not forget that even our very optimistic prophet, H. G. Wells, could not prophesy such tremendous de-

General Aeroplane Co.'s Verville type flying boat

in the air, it is controlled as aeroplanes are, with vertical and horizontal rudders. The seaplane complete weighs 20,000 pounds.

This yacht could easily carry four men, with supplies and the fuel necessary for crossing the Atlantic—and it could make the trip in about thirty hours. This means that before another year has gone by there will be constructed a flying yacht twice as large as this one. Glenn H. Curtiss believes that there is no limit to the size of an aeroplane, and, given the opportunity, he will start building a small air liner, with a wing span of 300 feet, capable of carrying twenty people across the Atlantic, or fifty people on a 1,000-mile cruise.

The war has undoubtedly advanced the aeroplane industry by ten years. In the early part of 1914 the half dozen constructors of aeroplanes and aeronautic motors together could only look forward to getting orders for forty aeroplanes and about twenty additional motors. To-day this number represents a week's output of the Curtiss Aeroplane and Motor Corporation. In 1914 all aeroplanes were "built"; to-day they are manufactured.

Congress having allowed close to \$18,000,000 for aeronautics for the land and naval defenses, the industry can look forward to a steady minimum business large enough to support it, with tremendous opportunity for unlimited development.

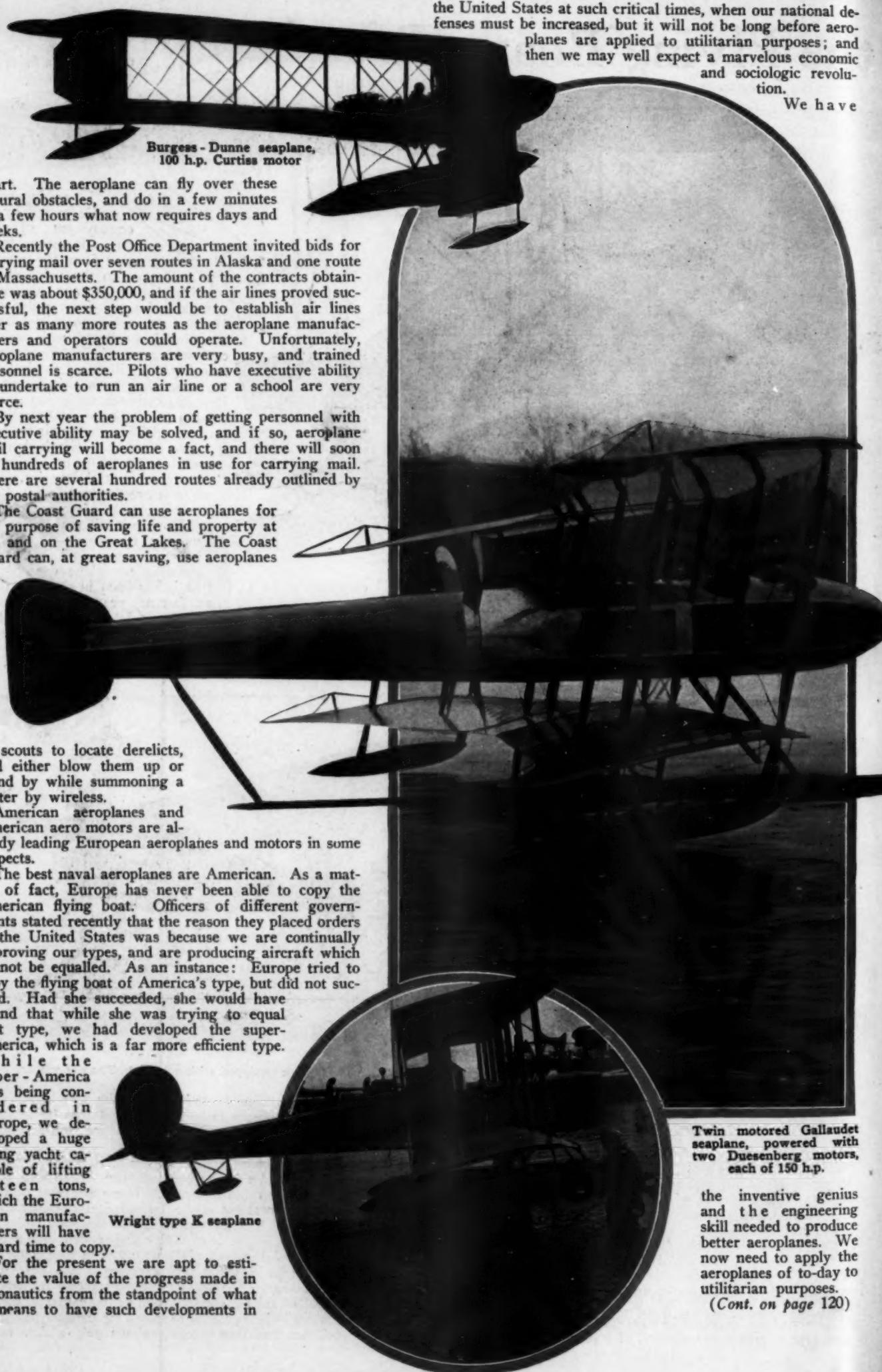
As aeroplanes increase in size, speed and general durability, they give to man a new method of transportation—of a stand-



Thomas seaplane equipped with a 135 h.p. Thomas motor

developments as have taken place in aeronautics. In 1902 people considered him visionary because he stated that he believed that by 1950 a heavier-than-air flying machine would actually leave the ground.

Twenty thousand aeroplanes could be used to-day for utilitarian purposes—and may be put into use within five years if efforts are concentrated that way. There are most difficult problems of transportation in the United States, Canada and South America which an aeroplane can solve easily and most economically. The U. S. Post Office Department has a plan to establish several hundred air lines as soon as people can be found to put in bids for mail carrying. All these lines represent problems to the Post Office—problems of getting around natural obstacles, such as mountains, canyons, waterways—which make it necessary to take long detours in carrying the mail between two places perhaps only a few miles



apart. The aeroplane can fly over these natural obstacles, and do in a few minutes or a few hours what now requires days and weeks.

Recently the Post Office Department invited bids for carrying mail over seven routes in Alaska and one route in Massachusetts. The amount of the contracts obtainable was about \$350,000, and if the air lines proved successful, the next step would be to establish air lines over as many more routes as the aeroplane manufacturers and operators could operate. Unfortunately, aeroplane manufacturers are very busy, and trained personnel is scarce. Pilots who have executive ability to undertake to run an air line or a school are very scarce.

By next year the problem of getting personnel with executive ability may be solved, and if so, aeroplane mail carrying will become a fact, and there will soon be hundreds of aeroplanes in use for carrying mail. There are several hundred routes already outlined by the postal authorities.

The Coast Guard can use aeroplanes for the purpose of saving life and property at sea and on the Great Lakes. The Coast Guard can, at great saving, use aeroplanes

as scouts to locate derelicts, and either blow them up or stand by while summoning a cutter by wireless.

American aeroplanes and American aero motors are already leading European aeroplanes and motors in some respects.

The best naval aeroplanes are American. As a matter of fact, Europe has never been able to copy the American flying boat. Officers of different governments stated recently that the reason they placed orders in the United States was because we are continually improving our types, and are producing aircraft which cannot be equalled. As an instance: Europe tried to copy the flying boat of America's type, but did not succeed. Had she succeeded, she would have found that while she was trying to equal that type, we had developed the super-America, which is a far more efficient type.

While the super-America was being considered in Europe, we developed a huge flying yacht capable of lifting fifteen tons, which the European manufacturers will have a hard time to copy.

For the present we are apt to estimate the value of the progress made in aeronautics from the standpoint of what it means to have such developments in

the United States at such critical times, when our national defenses must be increased, but it will not be long before aeroplanes are applied to utilitarian purposes; and then we may well expect a marvelous economic and sociologic revolution.

We have

Burgess - Dunne seaplane,
100 h.p. Curtiss motor

Twin motored Gallaudet seaplane, powered with two Duesenberg motors, each of 150 h.p.

the inventive genius and the engineering skill needed to produce better aeroplanes. We now need to apply the aeroplanes of to-day to utilitarian purposes.

(Cont. on page 120)

Practical Wireless for Motor Boats

The Selection of Transmitting Apparatus Best Suited to the Requirements of the Motor Boatman—The Fourth Article of the Series Appearing in MoToR BoatinG

By Austin C. Lescarboura

ACCORDING to the average newspaper reporter, the transmission of a wireless message is some sort of ritual enveloped in the deepest mystery. He would have us believe that the operator-mystic, manipulating an array of intricate apparatus, calls for a reunion of a thousand lightning bolts, the crash of several batteries of forty-two centimeter howitzers, and the display of glorious pyrotechnics compared to which the most celebrated fireworks fade into insignificance.

In his zeal to write an interesting story the reporter quite oversteps the bounds of veracity; at least, he allows his imagination

may be used in common by the transmitter and receiver of a wireless station, a so-called aerial switch being employed to switch the aerial on to the receiving or the transmitting set.

There are several methods of generating wireless or electromagnetic waves, but all of them are based on the rapid charging and discharging of a condenser across some form of spark gap. Accordingly, a simple transmitter consists essentially of a suitable source, a condenser, a spark gap, an inductance in the form of a few turns of heavy wire or strip, an aerial and a ground connection, and a telegrapher's key for breaking

up the waves into short and long trains to represent the dots and dashes of a telegraph code. It is very seldom that the current obtained from a battery or generator is of sufficiently high voltage or potential to be used by the wave-generating apparatus, and accordingly it is usually necessary to step up this primary current by means of an induction coil or transformer, or even by a motor-generator, in which case this additional piece of apparatus must be included in the transmitting set. The motor-generator is simply a motor which derives its motive power from the available current supply, and is directly connected to a generator that is wound to furnish a current of the desired voltage. Since it is necessary to employ alternating current to operate a transformer, a motor-generator is usually employed in converting the available direct current into alternating current.

It will be recalled that a receiving set may



Here is an ideal wireless set for the motor boat owner who wants the best apparatus procurable. At the left is a panel transmitter of $\frac{1}{2}$ k.w. rating, which operates in conjunction with a motor-generator set. Of course, this set is for use on large motor boats where a fair-sized aerial is available, and where 110-volt current supply is obtainable. It has a range of from 100 to 500 miles. At the right is a compact receiving set

tion too much liberty. For if you have found the reception of wireless messages a comparatively simple achievement when once its functioning is clearly understood, surely you will find the transmission of messages equally simple in its essentials. If anything, the transmission of wireless messages is simpler than the reception, although in the simpler forms of apparatus where an open spark gap is still employed the crash of the sparks has a slight touch of the spectacular.

The problem of transmitting a wireless message is diametrically opposed to that of receiving a communication. In the latter instance, it will be recalled, the waves were first intercepted by an aerial system and then detected with suitable apparatus. In the case of the transmitter, however, the problem is to first create the waves by some suitable means, and then impart these waves to space by means of the aerial system. The latter, of course,

A close view of the $\frac{1}{2}$ k.w. panel transmitter, showing the arrangement of the two meters, the aerial switch, the wavelength-changing switch, and the spark gap. This transmitter measures $14\frac{1}{2} \times 10\frac{1}{2} \times 12$ inches, and weighs 47 pounds. Its motor-generator and starter weigh 125 pounds.

For those who prefer to talk instead of converting their messages into dots and dashes, the wireless telephone is now an accomplished fact. Here is a typical wireless telephone station. After a few simple adjustments the motor boatman can talk into its mouthpiece to a distant friend with as much facility and certainty as if he were using his telephone at the office

be tuned to receive messages of different wavelengths, so that a number of transmitters can operate simultaneously in one locality without interfering unduly with each other. Now the determination of the length of the wireless waves is effected in the transmitter by the same two factors as in the tuning of a receiving set, namely, the capacity of the condenser, and the value of the inductance, both of which are in the wave-generating circuit of the transmitter. The details of tuning a transmitter will be discussed at length in the next instalment of this series.

With this elementary knowledge of wireless transmission, the motor boat owner contemplating the installation of a wireless station is in a position to analyze his particular requirements. It is the intention of the author in this connection not to specify any particular type of apparatus, for this

Practical Wireless for Motor Boats

MoToR BOATING for December, 1916

would be decidedly unfair to the remaining types, which, no doubt, often are equally excellent. But it is his intention to aid the motor boat owner in concentrating his final choice to a few types of apparatus which are known to suit his individual requirements to the best advantage. The author plans to direct, not to select.

For the small boat, say one of less than 40 feet in length or one on which the aerial is limited to a span of 30 feet or less, the transmitter is at once exceedingly simple and inexpensive. As in the case of the receiving apparatus, the aerial of this length is of such a limited capacity that an elaborate and power-

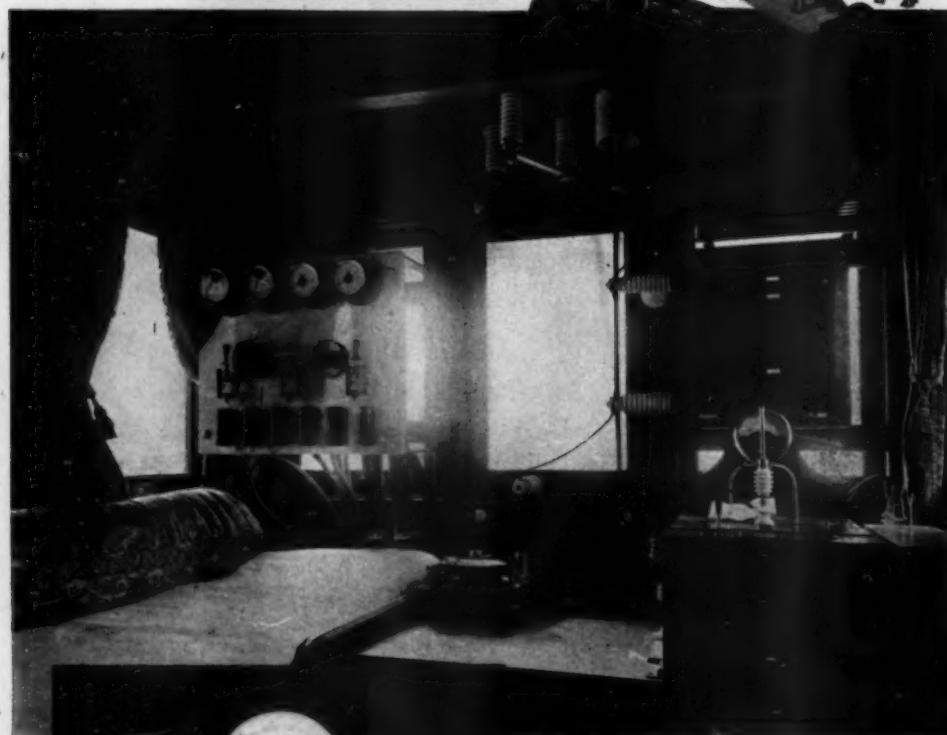
ful transmitting set would not prove vastly superior to a simple set; whereas the latter could operate up to its full efficiency, the former, because of the undersized aerial—undersized only when considered in connection with the powerful set—would probably be operating at a very low efficiency.

A simple transmitter, suitable for a small boat, should consist of a tuning inductance, a condenser, a plain spark gap, an induction coil of two- or three-inch rating, a telegraph key and a battery to operate the in-

duction coil. The owner desires the least expensive set obtainable he can select an induction



We all have our ideas on how to arrange our boats, hence many prefer to purchase transmitting apparatus as separate instruments to be arranged in the most pleasing manner. Here is a typical array of transmitting instruments, with the transformer at the left, then the condenser with the rotary spark gap above it, followed by the inductance, on top of which is a meter. In front are the protective device, the key, anchor gap, and aerial switch.



The wireless room of the Sialis, a 202-footer owned by J. K. Stewart. Neatness is immediately apparent in this wireless installation. The transmitting apparatus at the right and the receiving apparatus at the left are mounted on a spacious table provided with drawers, while at the extreme left is the switchboard.



For the small motor boat this panel transmitter and receiver is exceptionally complete. The former is rated at 1/10 k.w., and its dimensions are the same as the 1/2 k.w. transmitter. The transformer and interrupter can be wound for any supply voltage from 12 to 110 volts, so that the set can be used with a battery or on a lighting circuit. The smaller panel is the receiving set.

duction coil. The tuning inductance may be one of the simplest construction, with the wire or strip wound on wood, although rubber, porcelain or composition is preferable. The condenser, because of the moisture always more or less



something over 100 miles, and a transmitting range of from three to five miles. Sets such as these cost less than sixty gallons of gasoline. Figure it out for yourself!

coil of one-inch or even half-inch or quarter-inch rating, which will prove satisfactory for very short distances. In fact, if the coil selected is smaller than the one-inch size, the chances are that the limited range of the transmitter will make unnecessary the employment of a sharp or pure wave—a wave whose length is confined between close limits, as compared to one whose length extends over quite a range. In such an event the requirements of the law will hardly apply, since the set is probably of insufficient strength to transmit signals across the nearest State boundary or to seriously interfere with the reception of interstate messages by others. Thus the one-inch or fraction-of-an-inch coil may be used in connection with a spark gap only, without the condenser and inductance, materially reducing the cost of the set.

The battery employed to operate the induction coil may be of the dry cell or storage cell variety, but the latter is by

(Continued on page 88)

This is compactness at a low cost. Consisting of a complete receiving set and a transmitter with a one-inch spark coil, this small outfit is available for the smallest motor boat. It has a receiving range of

The 40-Mile Cruiser a Possibility in 1917

The Development of Cruiser Practice Which Has Resulted in the Modern Express Cruiser—Plain Truths Showing Why Next Year's Boats and Power Plants Will be an Improvement

By Thomas D. Bowes, M. E.



A Hickman 40-foot sea sled cruiser with two eight-cylinder $5\frac{1}{2} \times 6$ motors which shows a speed of 34 miles an hour

THE past season saw many new boats launched of the new express cruiser type, although most of them were completed too late to obtain very much in the way of reliable data. Of the many new boats launched, however, the greater number were express cruisers, and this type is fast becoming the most popular of all classes of motor boats. Deservedly so, as it has more of the qualities desired by the average motor boat owner in one boat than any other type. The demand for greater cruising radius in a given time is responsible to a large extent for the fast development of this type of boat.

It might be well to go back a few years and see just how the development of the express cruiser came about. After the glass cabin stage in the evolution of motor boats came the offshore cruisers. These boats were developed to meet the demand for good, wholesome craft able to make long trips at sea, and the long distance offshore races helped to a great extent to hurry their development. They were all designed to provide the maximum amount of accommodations on a given length. Their motors were slow-turning engines of the heavy-duty type, not over efficient for their weight and cylinder volume, and of rather limited power. Some good examples of this type of boat were the well-known Ailsa Craig, Ilys, Caliph, Barbara, Dream and Marguerite. The average speed of these boats was less than ten knots, and they were

considered fast for their

especially Ailsa Craig which

record for the Bermuda

While this type of boat

developed, each one in

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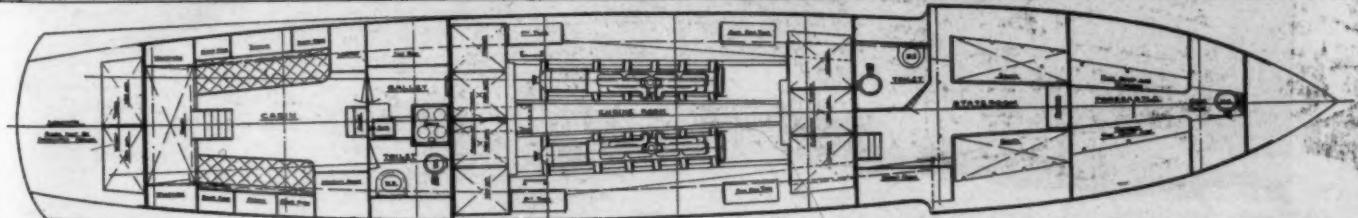
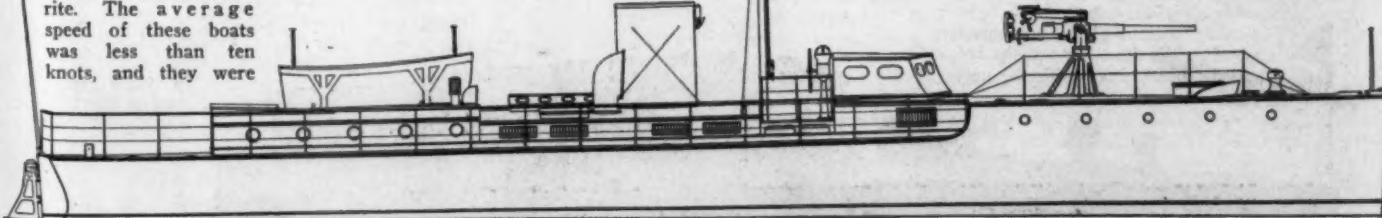
There

dem and

available

deck space. This, no doubt, was brought about to some degree by the growing feeling among motor boat racing enthusiasts that they would rather be the first boat in, even though they did not win the race, than be the last one in and win on time allowance. One of the first boats built with this thought in view was Gosssoon, designed by the firm of which I am a member for its own use. This little

A 55-foot Ludders express cruiser which, with one six-cylinder $6\frac{1}{2} \times 7\frac{1}{2}$ motor, has a speed better than 20 miles an hour



A Bowes and Mower 73-foot cruiser now building according to plans approved by the Navy Department. With two 400 h.p. motors a speed of better than 30 miles an hour is expected

boat was the forerunner of the many successful examples of the express cruiser class that came later and brought about the recognition of such a class of boats by the A. P. B. A. Gossoon was 38 feet long, of moderate beam, with fair cruising accommodations, and what was then considered a great deal of engine for that time. Her motor was a six-cylinder Loew-Victor, developing about 45 h.p. at 800 r.p.m. Her speed was too fast for her rating to permit her to race in the offshore races with the other cruising boats, and she was barred from such events by the committee in charge of offshore races on the Jersey Coast; even though she complied with all the requirements of the A. P. B. A. for cruising motor boats.

At the next meeting of the A. P. B. A. it was decided to provide a class for such boats to race in, and the class were called express cruisers, to distinguish them from the day boats and cruisers. This class of boat had less cruising accommodations, and more speed and deck room. As the motor boat owners came to realize that the press of modern business prevented them from using their boats for long cruises, the demand for a boat that could cover more ground in a smaller space of time grew fast. Cruising boats that would not make more than 10 or 12 miles per hour were used more for afternoon and week-end trips than they were for cruising. The qualities desired for this service were increased deck accommodations, and great increase in speed. The American people had become accustomed to fast travel on land in their pleasure cars, and demanded the same in their pleasure boats.

Before the advent of the express cruiser the only way this desire could be indulged in was with a fast runabout, or a hydroplane. These boats, of course, were wet and uncomfortable, and their owners soon found that they wanted more ease and safety with their speed. To obtain such results it was necessary to produce larger and more efficient engines on smaller weight.

The first motors developed to meet this demand were of two classes—the regular heavy-duty engine, with larger valves, higher compression, lighter moving parts and higher rotative speed; while the other was the automobile motor fitted with the necessary



Kingfisher, a Hand V-bottom 60-foot express cruiser with two six-cylinder 140 h.p. motors, having a speed of 23 miles an hour

auxiliary equipment for marine service. Neither of these types was very satisfactory, with the made-over heavy-duty motor probably the lesser of two evils. The first boats of the express cruiser type built were small, due to the impossibility of obtaining suitable power plants. They ranged in length from 40 to 50 feet and were capable of speeds varying from 18 to 25 statute miles per hour.

They were, of course, very popular and greatly in demand. Among the earlier boats designed by my firm that indicate the gradual development of the class were Gossoon, 15 miles; Lillian S, twin screw, 20 miles; Daneva II, 22 miles, and Enchantress, 26 miles, this speed during the second season being increased to 28 miles. The length increase was from 37 to 48 feet, showing the desire for larger fast boats.

For the following season it was easy to foresee a demand for notably larger boats of high speed, but the stumbling block in the way of producing such boats was again the power plant. The marine engine builders always seemed to be a long way behind the

demand, and while they had succeeded in producing motors that were moderately successful for open or day boats of the well-known Shadow and Flier types that had been so successfully turned out by the Seabury Company, they had not produced a motor that would be considered satisfactory for the out-and-out express cruiser of the larger type.

What was needed was about three times as much power out of the same sized engines. Instead of getting 1 h.p. for every 4.5 cubic inches of cylinder volume, 3 h.p. was necessary.

Among the first of the larger express cruisers turned out by my firm were Akbar, owned by Geo. W. C. Drexel, and Enchantress II, owned by Louis Burk, who also owned the first Enchantress. These boats were capable of approximately 25 statute miles per hour, and were equipped

with two made-over medium-duty engines each. Their motors had a maximum r.p.m. of 900, and at this speed would develop about 190 h.p. each, or 380 h.p. total for each boat.

The European war created a demand for fast motor patrol boats. This, of course, made more urgent than ever the requirement for engines of larger power on small weight. Such a large volume of business as accrued gave the marine motor builders a chance to spend the money necessary to produce a new type of engine to meet this demand. The earlier engines would develop about 200 h.p. on 3,500 pounds of weight at 800 to 1,000 r.p.m., while the recent engines they have tried to turn out would develop 400 h.p. on 3,200 pounds of weight, at 1,000 to 1,500 r.p.m.

With the thought that they now could obtain motors suitable for high-speed express cruiser work, many owners contracted for express cruisers from 70 to 90 feet in length, with estimated speeds from 25 to 30 miles per hour. Many boats of this size were built with the thought that they would also be useful in time of war as scout patrols and submarine chasers.

Due to the failure of the power plants, there was not a single one of all the larger boats turned out with the idea of producing 30-milers that could be kept going. But few of the new type motors of large power and high speed made good this season. The reason for this is very easily understood. It was due to inferior workmanship to a very (Continued on page 90)



Get There, a type of express cruiser which has become very popular. With a length of 58 feet and two 200 h.p. motors a speed of 30 miles an hour is easily obtained. This boat was designed by Tams, Lemoine and Crane of New York City

A 95-Foot Steel

**Southwark-Harris Engine, Operating at 300 R.
15 M. P. H.—Fuel Oil Capacity Sufficient**

THE motor yacht Georgianna III is a new Diesel vessel built by the Harlan and Hollingsworth Corp., of Wilmington, Del., for William Griscom Coxe, and she

principle to carry The frames are of spaced twenty inches hull is divided into

Diesel Yacht

P. M., Drives Georgianna III at a Speed of for 2,000 Miles Cruising Radius

fresh water. are over-lapped to give greater strength. The upper, quarter and forecastle decks are bulb angle steel, plated with steel stringers and plates lightened by holes. The skylights over the engine-room



Photographs by Pearce

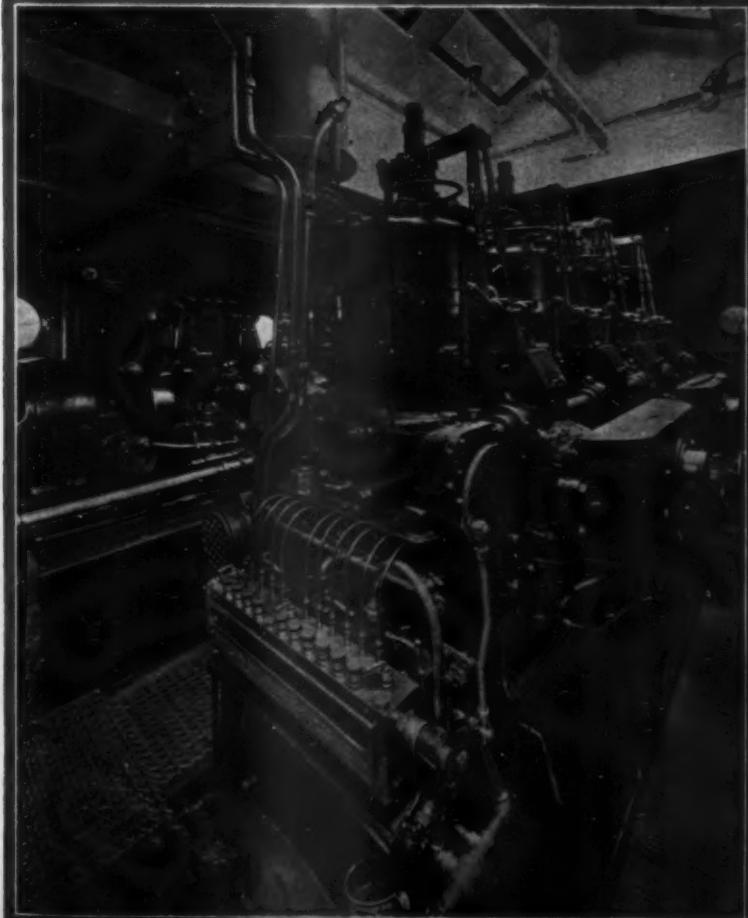
Georgianna III is owned by William Griscom Coxe, of Wilmington, and was designed by him and A. M. Main, of the Harlan-Hollingsworth Corp.

is unique in some respects, embodying her owner's ideas of maximum strength and safety with minimum of ballast to obtain all necessary desiderata of speed, stability, comfort, etc. The yacht was designed by her owner in conjunction with A. M. Main, naval architect for the builders. Her length is 95 feet 2½ inches, her beam 15 feet 2 inches, her molded depths, 9 feet 4 inches, and her draft 5½ feet.

For a portion of Georgianna's length a double bottom is constructed on the cellular



The main saloon is finished in oak and all furniture and the overhead beams are of quartered oak



The power plant is a four-cylinder 9x13-inch Southwark-Harris Diesel, started and reversed by compressed air. A Frisbie auxiliary set is also installed

tight compartments by six steel bulkheads. Four bulkheads are fitted with water-tight doors of a type similar to those used on torpedo boats. The floor plates, garboard streak of shell and sheer streak are of 10-pound plate, the thinnest steel plating being about 7 pounds. The upper shell is built flush and smooth, having straps fitted at the edges and the butts; below water, the edges

and the deck-house are of steel. Bulkheads and decks of the same material enclose the galley and obviate the spread of a fire.

The general arrangement of the vessel is almost identical with that of the old Georgianna II, except that as the new craft has 25 feet additional length it has been possible to lengthen out the owner's quarters and galley and give improved storage facilities. Beginning forward, the forepeak, in which water ballast can be carried if desired, is piped to the bilge pumps, and a locker is built in for stowage of chain cable.

The owner's bathroom, fitted with tub piped for hot and cold salt and fresh water, comes aft of the peak, and next following is the owner's stateroom, having a three-quarter bed and a Pullman berth, two bureaus and pier glass. The main saloon is paneled in quartered oak and is upholstered in English tapestry. Three built-in beds and a Pullman berth are provided.

Abaft the saloon is a hallway with stairway to a companion on the upper deck. Opening off the hall is a guests' toilet, and to starboard is the children's stateroom. The galley comes next aft and following it is the engine-room, which, in addition to the machinery, is fitted with fuel oil tanks, toilet and wash basin for the crew. The main engine foundation consists of fore and aft girders which take the holding down bolts. These girders are connected to the shell of the vessel and to deep



The deck-house is of steel, but is paneled in white mahogany. The navigating bridge is above it

floor plates, making a rigid foundation. The auxiliary engine which drives the air compressor and electric generator is mounted as a unit on one foundation and sets on one of the oil tanks, which is strengthened to suit.

The engine-room is lighted and ventilated by the stack, six 9-inch ports and the skylight previously mentioned. Two 8-inch copper cowl ventilators and a booby hatch are also provided.

The crew's quarters extend from the after

bulkhead of the engine-room to the after peak bulkhead. The captain and engineer are provided with separate staterooms, and in the after castle are two metal beds for the deck hands.

Georgianna is pro-

pelled by a Southwark-Harris Diesel engine designed to indicate 240 h. p., with a b. h. p. of 150 at 300 r. p. m. The engine has four cylinders 9 inches in diameter by 13 inches stroke. It is directly reversible and can, it is stated, be brought to full power from stone cold in ten seconds. The fuel tanks have a capacity of 1,070 gallons, and at a consumption of eight gallons per hour when running at a 15-mile speed give a cruising radius of 2,000 miles. The air bottle containers for compressed air used for starting and for operating the whistles, etc., have a sufficient capacity to enable the engine to be started fifty times on one charge.

An interesting feature of Georgianna III is her system of steel bulkheads. Note the water-tight door in the background of this picture

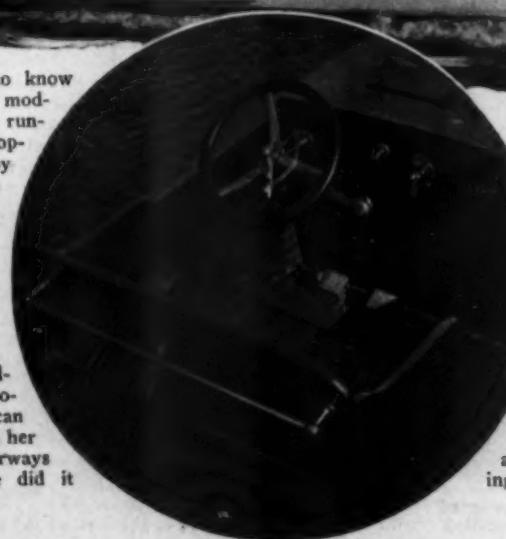


A Well-Designed Runabout

Wanderer, a Niagara 25-Footer Which Is Fitted with Pedal Reverse Control and Includes Electric Starting in Its Engine Equipment—Speed of 15 Miles Attained



If you care to know whether the modern water runabout is easy to operate, ask the boy who runs one. In the present case, Wanderer, a helmsman of seven summers is guiding the destiny of the craft, and if we know anything about modern boats and motors and American youth he can run her in crowded waterways as easily as he did it



Wanderer is equipped with a four-cylinder Sterling engine which turns a 16x20-inch wheel at 1,000 r.p.m.

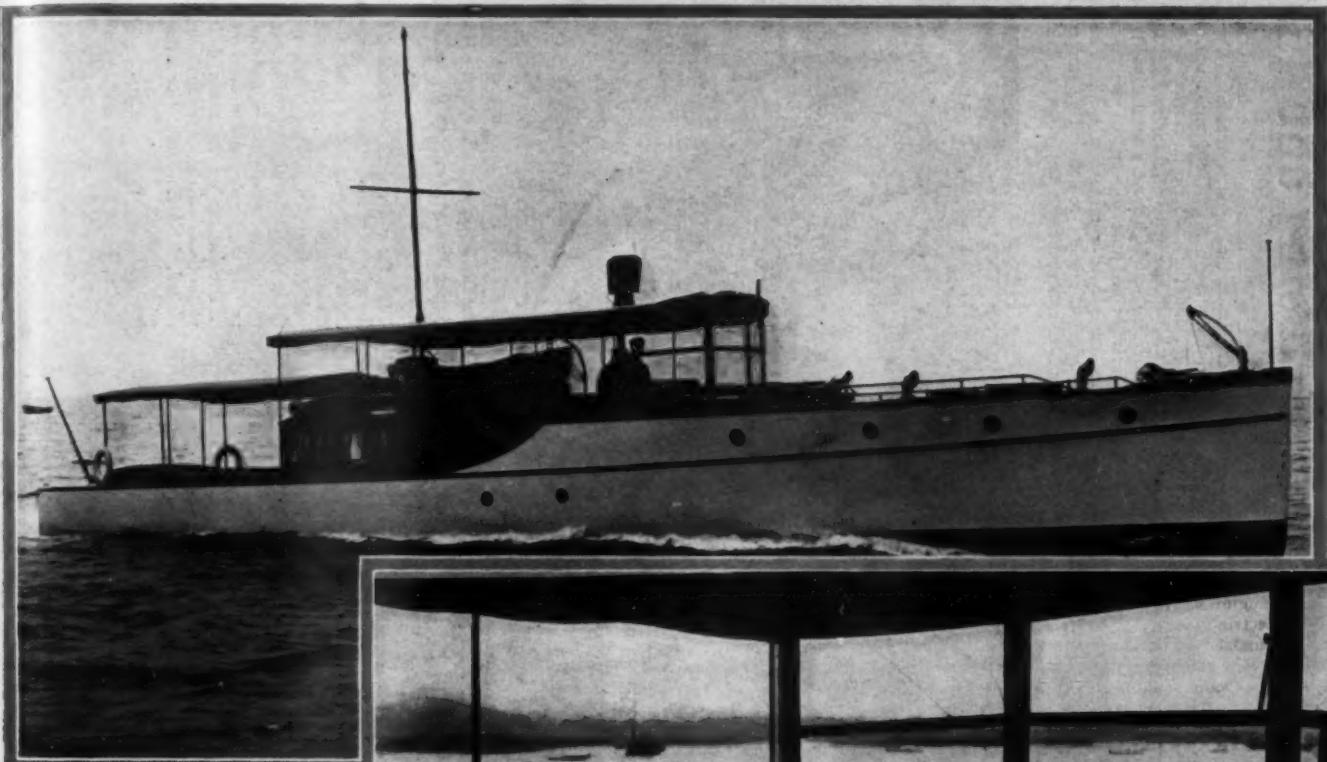
Motor Boat Co., of North Tonawanda, N. Y., and owned by C. R. Boyce, of Memphis, Tenn. A good deal of pride has been lavished on this craft from builder, engine maker and owner alike, and, to all appearances she is a boat well worth being proud of.

latest design is furnished, and on the forward deck is mounted an electric searchlight which is controlled from the steersman's position by a simple lever. The vertical movement of the light is obtained by turning this lever to right and left, while the horizontal motion is imparted by moving the lever forward or back.

The motor installed is a 17-25 h. p., 3 1/4x5 1/2-inch four-cylinder Sterling, equipped with lighting and starting system. A feature of the boat's fittings is the pedal reverse control which does away with the necessity for a hand lever. The engine turns a 16 x 20-inch wheel, and at 1,076 r. p. m. gives a boat speed of 15 m. p. h. Wanderer's beam is 5 feet.

A 67-Foot Raised-Deck Yacht

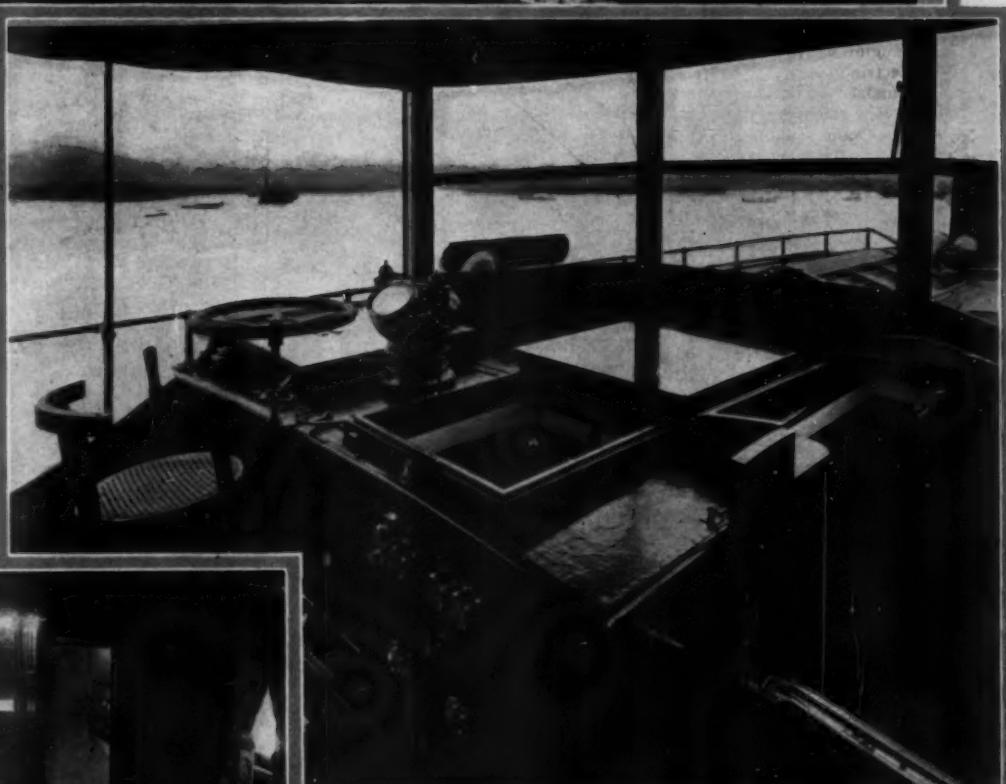
Privateer, the New Seabury Cruiser Owned by the Dock Commissioner of New York City—
Beautifully Finished and Equipped and One of the Finest Ever Turned Out by These Builders



From her two Speedway motors Privateer derives a speed of 20 m.p.h.

PRIVATEER is a new raised-deck yacht owned by the Hon. R. A. C. Smith, Dock Commissioner of New York City. She was designed and built by the Gas Engine & Power Co. and Chas. L. Seabury & Co., Cons., of Morris Heights, N. Y., and is very substantially constructed with oak

Photographs by Rosenfeld

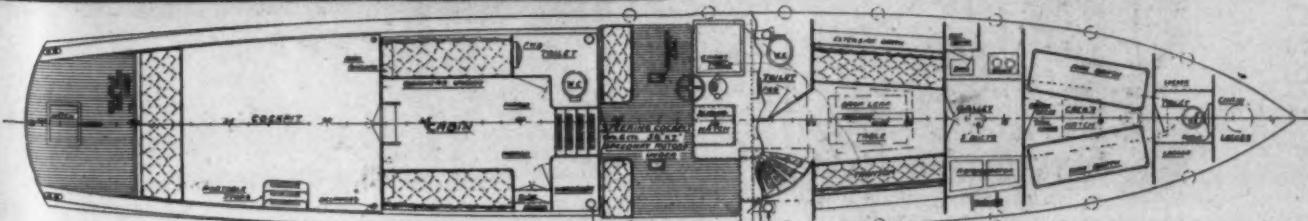


The steering cockpit is the focal point of Privateer, in the sense that all of the compartments are entered from there

frame work and cedar planking. The yacht measures 67 feet 2 inches in overall length by a beam of 11 feet 3 inches and a draft of 3 feet 1

inch. She is powered with two six-cylinder 5 1/4 x 7-inch 75-150 h.p. Speedway engines, giving a speed of 20 m.p.h.

Under the long forward deck are the crew's quarters, galley and main saloon, and the engines are installed under the bridge deck, leaving room aft for cabin and cockpit.



Arrangement plan of Privateer. This 67-footer is powered with two 150 h.p. Speedway engines which are fed from a 375-gallon copper fuel tank under the after deck

Vagabondia, a 130-Foot Houseboat for Florida Cruising and Fishing



Vagabondia is of the river steamer type, with her main deck given over to crew's quarters and storage and her upper deck to the apartments of the owner

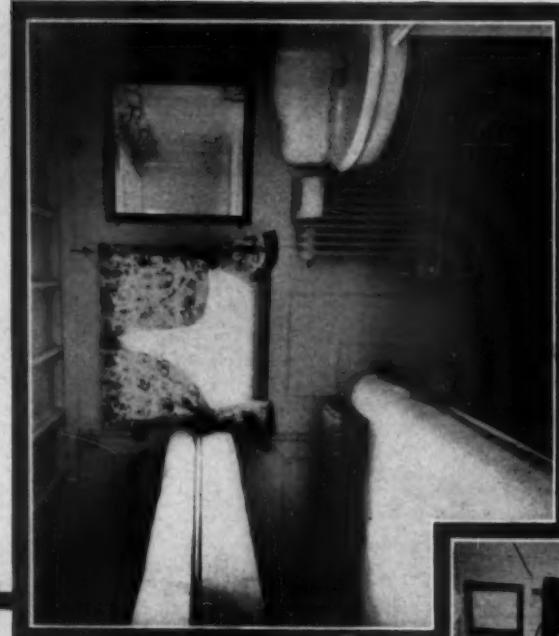
THE motor houseboat *Vagabondia*, designed by Cox & Stevens, and built by the Gas Engine & Power Co. and Chas. L. Seabury & Co., Cons., of Morris Heights, N. Y., for W. L. Mellon, of Pittsburgh, Pa., was completed in October and is now cruise-

ing in Florida. This motor yacht is the second of the same name owned by Mr. Mellon and is designed as a result of his extensive experience in Southern waters. Her type is similar to that of the Southern river steamer,

and the tunnel form of construction is used to keep the boat draft to a maximum of 3 feet. The length is 130 feet and the beam 23 feet 6 inches.

The hull proper of *Vagabondia* is not used for living quarters, except for a small portion forward where a few of the crew are

housed. The balance of the hull is devoted to machinery space, water tanks and storerooms. Two six-cylinder 150 h.p. Winton motors are placed amidships, giving a speed of 10 miles, and the gasoline is carried on the main deck aft in a heavily constructed steel tank of 2,500 gallons capacity. The water tanks, which have a total capacity of 6,000 gallons, are placed in the hold forward of the machinery space. Aft of the engines is a large fish well. The main deck is given over to the mess room, galley, storerooms, toilet facilities and six staterooms for ship's officers, fishing guides and others.



The staterooms are provided with hot water radiators

On the upper deck are located the owner's quarters. The forward house contains, at the after end, a smoking room, and the after house has a large living and dining room at the forward end, from which a central hall runs aft to a sitting room opening on the quarter deck. On either side of the passageway are staterooms to the number of six, in addition to two bathrooms, refrigerator room and a storeroom for clothes. The houses on the main deck are painted white, while those on the upper deck are of mahogany, varnished. The general interior scheme is simple paneling, painted white.

Vagabondia has a complete outfit of auxiliaries, including large dynamos, ample storage battery capacity, electric windlass, air compressors, bilge and fire pumps, etc. The small boat equipment is also large, there being a 30-foot owner's runabout, a 21-foot cutter, a 26-foot runabout and an 18-foot lifeboat, in addition to several dinghies, fishing boats and canoes.

The power plant comprises two 150 h.p. six-cylinder Winton motors, which give a boat speed of 10 miles. The auxiliary equipment is complete

A passageway runs the length of the after deckhouse, terminating at one end in the dining saloon and at the other in a sitting room



Islander, a Distinctive

Noteworthy for Unusually Generous Accommo-
mented by a Roomy Pilot-House—Speed

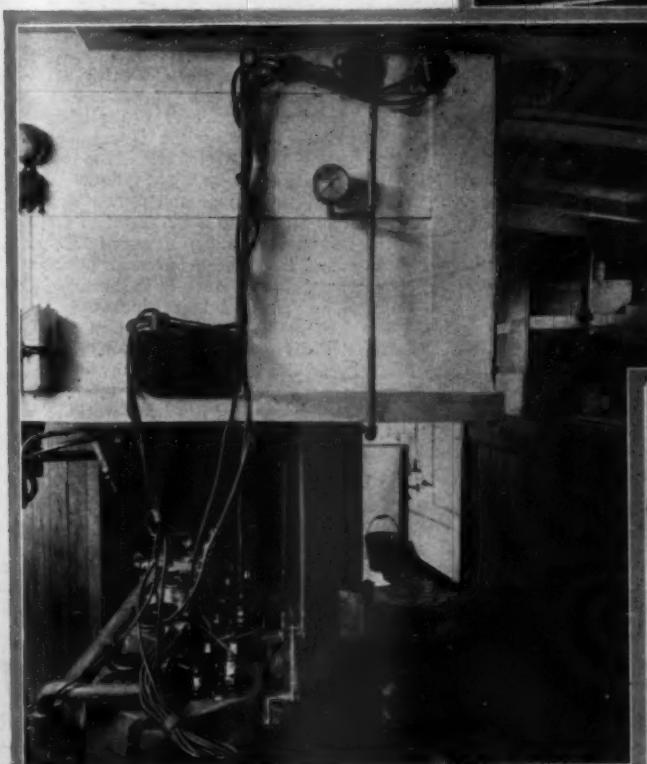
50-Footer

dations, Which Are Further Aug-
of 15 Miles Attained



Islander is a thorough-going cruiser owned by
J. B. Osborn, of Boston

ISLANDER, as may be seen from the accompanying illustrations, has more than the usual accommodations of a 50-footer, with the further addition of a pilot-house. The boat, owned by J. B. Osborn, of Boston, Mass., was designed by John G. Alden, of Boston, and built by F. S. Nock, of East Greenwich, R. I.

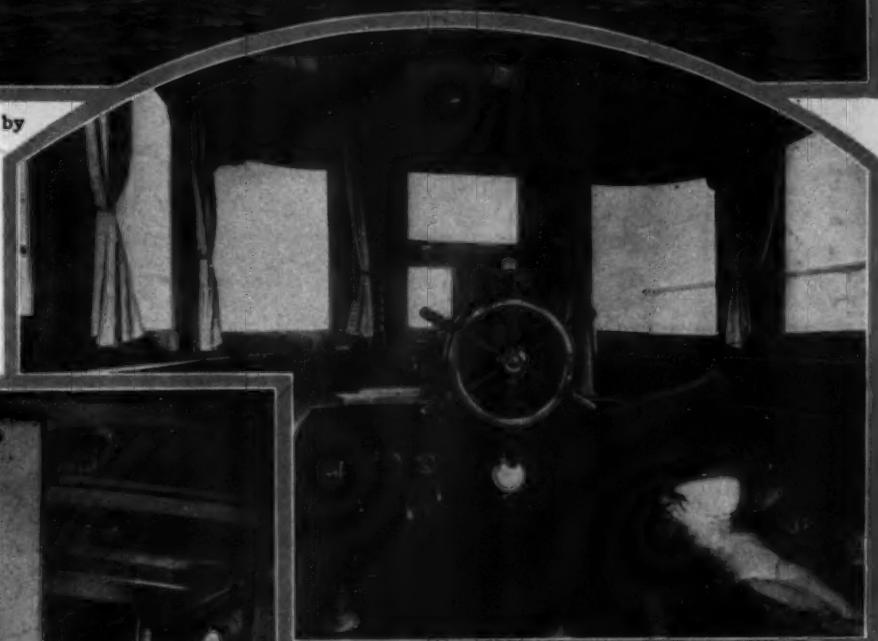


Photographs by Stebbins

The motor is an eight-cylinder Van Blerck equipped with slow-speed camshafts, developing 70 h.p. at 600 r.p.m.

The interior is arranged for two double staterooms, each connected with a toilet, a good-sized saloon, large galley, and engine-room with crew's berth and separate toilet. One of the staterooms is arranged forward of the engine-room, and the other at the rear of the boat. The engine compartment is beneath the pilot-house, while the galley is placed between this room and the saloon, connecting with both. Free access is had to all parts of the yacht and full headroom is allowed throughout.

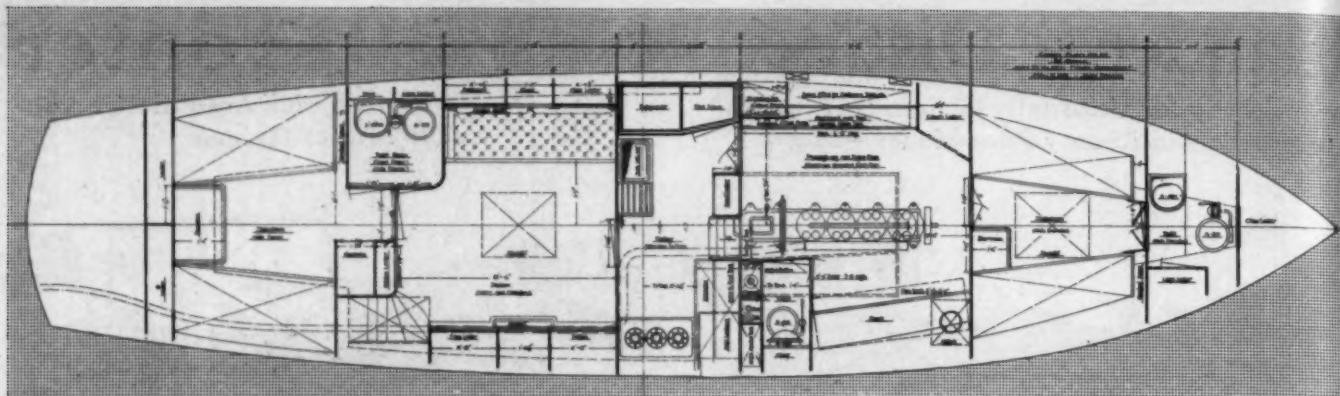
The pilot-house is entered from the deck and also from the galley, the latter feature being considered by the owner particularly useful, especially in bad weather. The windows of the house are water-tight under all conditions but are easily opened.



The pilot-house has entrances from the deck and from the quarters below. The windows are water-tight under all conditions, but are easily opened



There are two double staterooms in addition to the saloon. Islander's arrangement plan may be seen on the page following



Islander is so arranged that free access is had to all quarters, and full headroom is allowed throughout. Accommodations for a one-man crew are provided in the engine-room

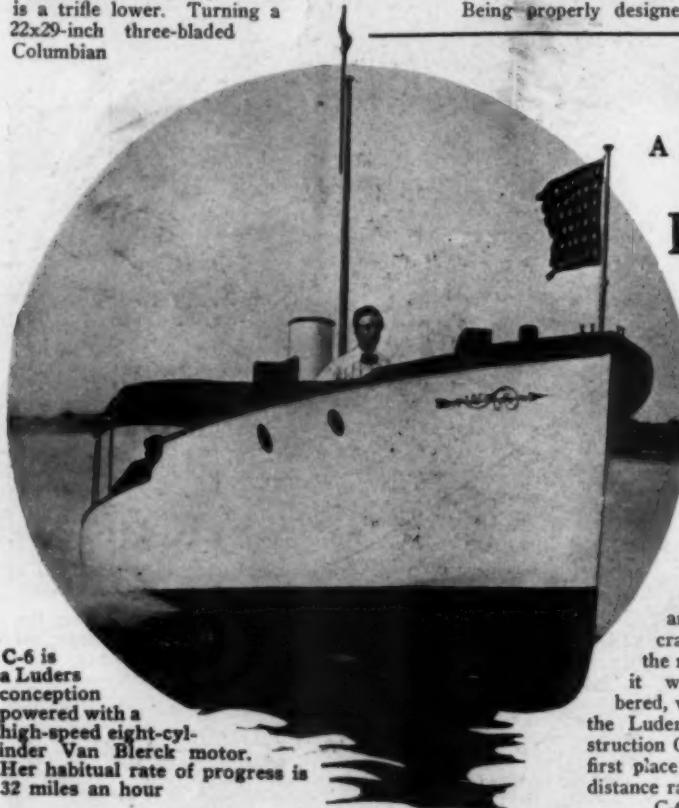
The power plant is an eight-cylinder 5½x6-inch Van Blerck held down to 600 r.p.m. and developing about 70 h.p. The motor is a standard model except that it is equipped with slow-speed camshafts and slightly different timing, while the compression is a trifle lower. Turning a 22x29-inch three-bladed Columbian

propeller, the speed attained is about 15 miles an hour. The tanks, with a capacity for water of 180 gallons and for fuel of 240 gallons, are placed amidships.

Islander's dimensions are, length over all 51 feet, beam 12 feet and draft 3 feet 6 inches. Being properly designed and strongly built,

she is a good sea boat, especially free from deep rolling and jerkiness in a seaway. She steers very easily in a following sea and has been taken out in real storms with perfect safety.

Mr. Osborn uses Islander around Boston and along the Maine coast.



C-6 is a Luders conception powered with a high-speed eight-cylinder Van Blerck motor. Her habitual rate of progress is 32 miles an hour

Photographs by Brown and Dawson

C-6—Vidette

A New 36-Foot Day Cruiser of Unusual Speed—Underbody of Wave-Collecting Design

HARDLY a year goes by without the purchase of a Luders boat by one of the members of the Chesebrough family. This year it was Amaroo, a swift 36-footer built for Augustus Chesebrough, of Northport, L. I. Shortly after the boat was built, however, her owner traded her to W. P. Frost, of Stamford, Conn., for his Cero, and the former

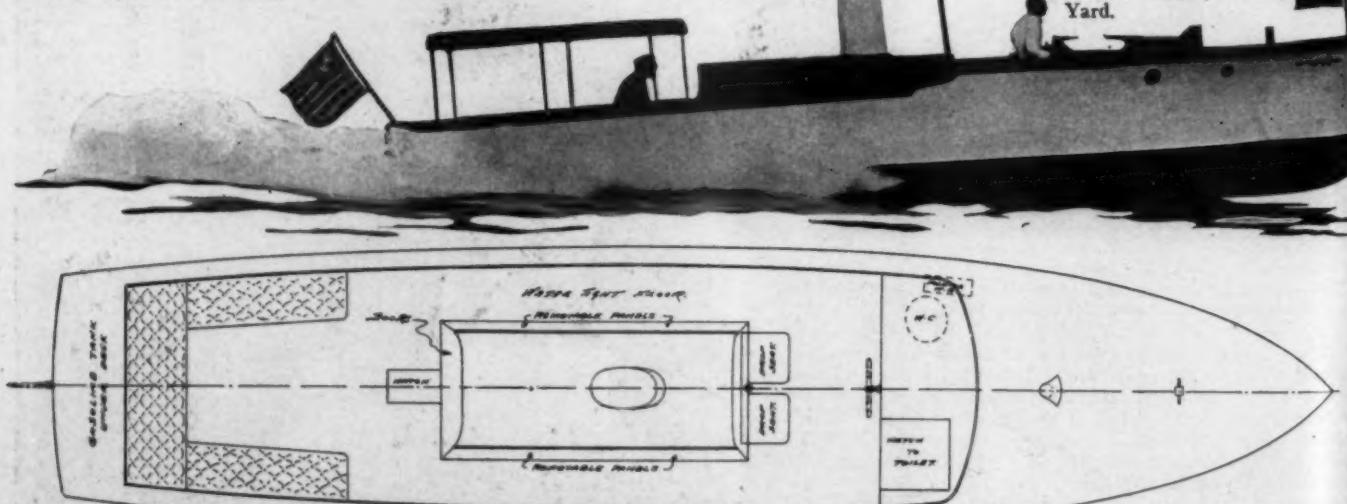
craft now bears the name C-6. Cero, it will be remembered, was also built by the Luders Marine Construction Co., and has won first place in several long distance races.

C-6 is an express cruiser of the day

type, with the usual accommodations for a boat of this sort. She is arranged with a large after cockpit and a steersman's cockpit forward, an awning protecting the latter from the elements. Of the raised-deck type, she is provided with a toilet forward, and the engine-room contains emergency sleeping accommodations. The boat's underbody is of the wave-collecting type, and C-6 easily maintains her guaranteed speed.

From her type and speed, C-6 might be called a vidette boat, for she is capable of doing fast scout and patrol work. Her engine installation consists of an eight-cylinder Van Blerck with 5½-inch bore and 6-inch stroke. This motor is fitted with a Berling dual spark magneto, and at 1,400 r.p.m. develops 135 h.p. It is controlled from the helmsman's position. The boat length is 36 feet by a beam of 8 feet and a draft of 2 feet 6 inches.

The Luders Marine Construction Co. is declared to have had an exceptionally successful year, having launched many boats of varied types. One of the most interesting on which the concern has been working is the 66-foot patrol boat for the United States Government. This is the larger of the two boats recently ordered. When completed it will be stationed at the Brooklyn Navy Yard.



Deck plan of C-6. The trunk cabin is arranged with panels which may be removed to provide additional light and ventilation to the quarters below

A New Patrol Type Cruiser

Scimitar IV, a 40-Footer Whose Hull Is Identical With Those of the Patrol Squadron Vessels—Van Blerck Motor of 130 H. P. Gives Top Speed of 28 Miles an Hour

THE lines of the express cruiser shown in the accompanying illustrations will probably suggest to the reader the clean-cut design of the 40-footers in the First Patrol Squadron. The difference in Scimi-

22 x 26-inch Columbian propeller, gives a boat speed of 26 miles an hour. Mr. Rogers de-

The quarters below comprise a toilet in the forward end of the boat, and a main cabin aft of it, with the galley immediately forward of the exit to the bridge deck; and aft of the engine



Scimitar's owner believes that his boat is superior in speed to any of the Power Squadron craft

tar's superstructure will lead one slightly astray, but, as a matter of fact, her hull is a duplicate of the patrol boats which made their mark in the naval maneuvers off Newport. Scimitar IV, therefore, is 40 feet long with a beam of 8 feet, and was designed by the Boston firm of Swasey, Raymond & Page. She was built by Britt Bros., and is powered with a 130 h. p. Van Blerck motor.

The owner, H. Ernest Rogers, of Brookline, Mass., and Winter Harbor, Me., watched the performance of the Patrol Squadron boats with a lively interest, for they were delivered before he could get his. When she finally reached his hands he found her somewhat faster than he had expected her to be and reached the conclusion that she could show her heels to any of her predecessors. The Van Blerck motor operates at a normal speed of 1,400 r. p. m., and, turning a

clares that his craft is capable of an addition a 1 1/2 miles an hour when it is needed.

There is a double stateroom aft for the owner



Photographs by Stebbins

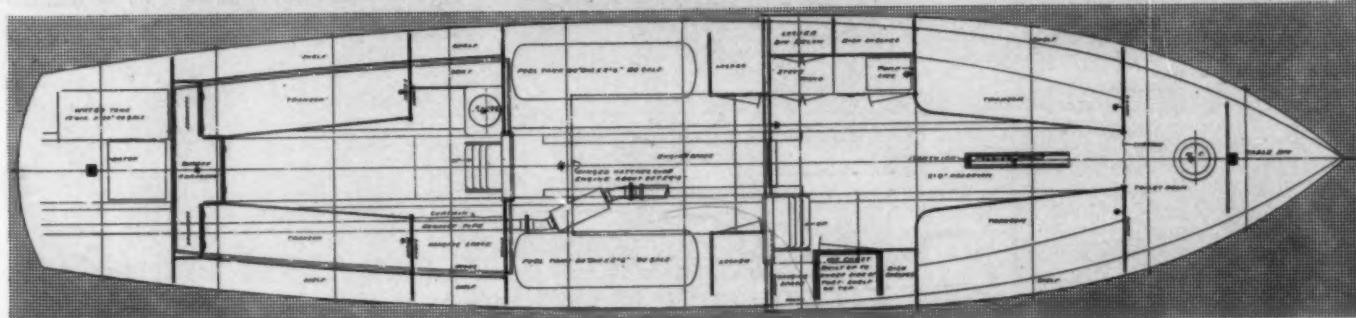


The main cabin forward is arranged with folding table and galley facilities

compartment the owner's cabin, which is also entered from the bridge. The engine is installed beneath this deck, and 90-gallon fuel tanks flank it on each side.

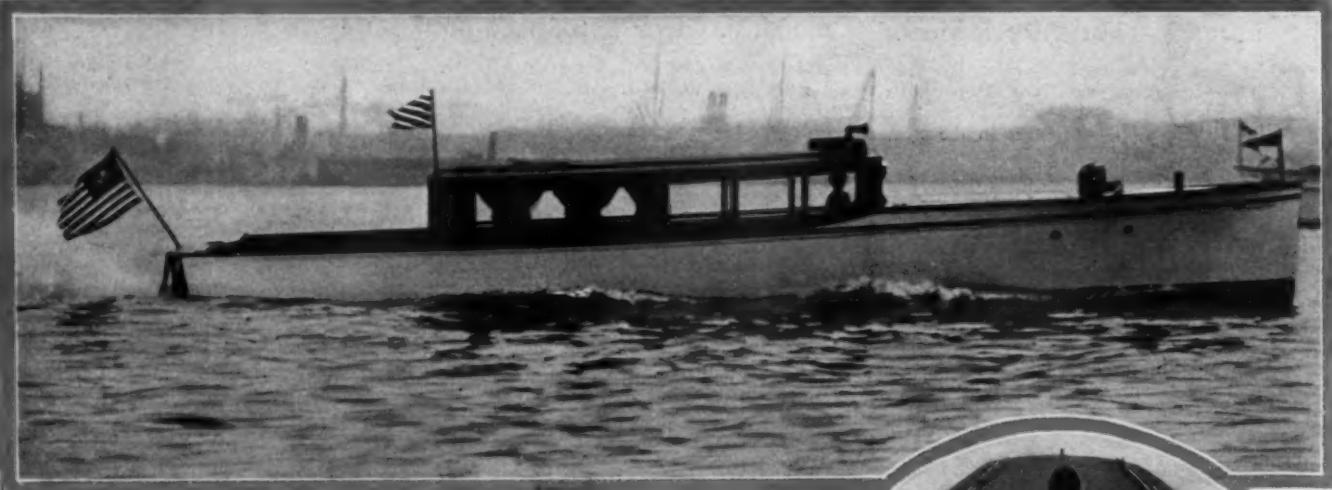
A Quick Glance at Scimitar IV's Features

Type.....	Patrol Squadron
Length.....	40 feet
Beam.....	8 feet
Draft.....	2 1/4 feet
Engine.....	130 H.P. Van Blerck
Speed.....	28 M.P.H.
Designer.....	Swasey, Raymond & Page
Builder.....	Britt Bros.
Owner.....	H. Ernest Rogers



A 5 1/2x6-inch six-cylinder Van Blerck motor is installed under the bridge deck. This power plant turns a Columbian propeller and gives an average speed of 26 m.p.h.

A 49-Foot Tender and Day Cruiser

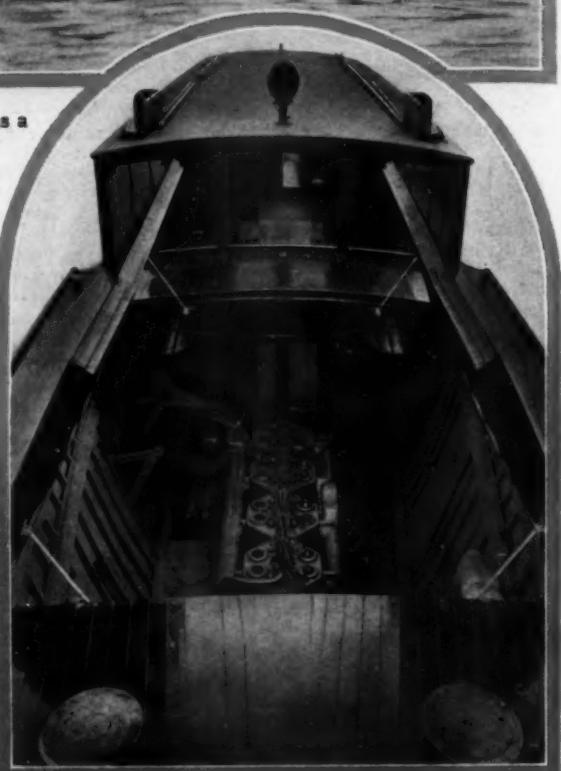


Baby Enchantress is owned by Louis Burk, of Philadelphia, who uses her as a tender for his *Enchantress II* and as a day cruiser

BABY ENCHANTRESS is a day cruiser, built recently by the Essington Shipbuilding Co., of Essington, Pa., for Louis Burk, of Philadelphia. She is the third of the Enchantress family designed for Mr. Burk by Bowes & Mower, of Philadelphia, and was built to serve as tender for Enchantress II, the big 75-foot express cruiser. Whence comes the "Baby" in her name; but she is a rather large infant, being 49 feet 3 inches in length, and quieter than the average—and every indication points to her being a fast one when she gets settled in her ways, for she showed 24 m.p.h. on her trial trip.

Her owner intends to use Baby Enchantress

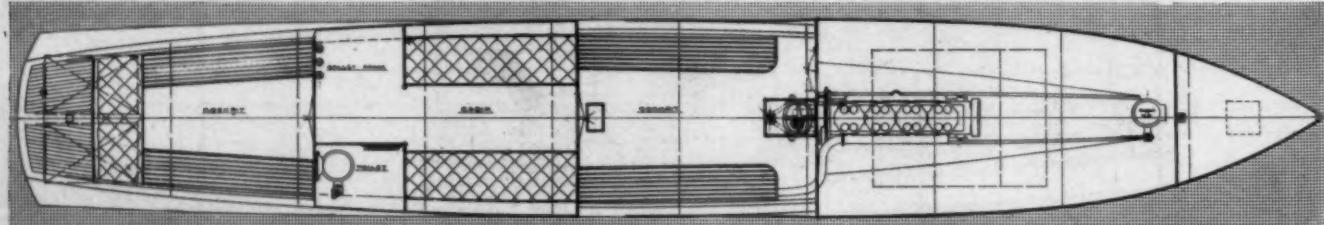
not only as a tender for his motor yacht, but for afternoon runs and week-end fishing trips to places where the larger boats cannot go. For these purposes she has been given good free-board and general seaworthiness, while her draft has been kept down to 3 feet. The accommodations consist of an engine compartment under the raised deck forward, a central cockpit, a covered cabin and an after deck. The forward compartment provides toilet and



The eight-cylinder Van Blerck is installed forward under hinged hatches. Accommodations for the paid hand are arranged forward of the motor. In the picture at the left, a view is shown of the cabin and the central cockpit



Photographs by Pearce



The central cockpit, being covered over, is almost an integral part of the cabin. The after cockpit is left uncovered so that anglers may have freedom of movement in casting and reeling in.

sleeping accommodations for the paid engineer. The cabin is ten feet long and has a toilet and a small galley space at its farther end. The two transoms with which it is furnished may be converted into comfortable berths.

Baby Enchantress is equipped with an eight-cylinder $5\frac{1}{2}$ x 6-inch Van Blerck motor which gave the above-mentioned speed of 24 m.p.h. on the trial trip at a crankshaft speed of 1,200 r.p.m.

The waterline length of this day cruiser is 48 feet 8 inches and the beam 7 feet 9.

A Cruiser for Lake Erie

A Big 51-Footer Built for the President of the Buffalo Gasoline Motor Company—Suitable Not Only for Day But for Long Distance Cruising and Capable of Weathering the Hardest Blows

ROMANA, shown in the accompanying illustrations, is a 51-foot cruiser with 12-foot beam and about 4-foot draft, which was designed by Morris M. Whitaker, of Nyack, N. Y., for Commodore L. A. Fischer, president of the Buffalo Gasoline Motor Co., of Buffalo, N. Y. She was built at the plant of George Elliott, of Buffalo. The problem in design-

excellent life-preserved. Similar cushions are distributed along the top of the cabin which rises above the deck amidships. The cabin is finished in mahogany and on it is mounted a ninety-pound cedar yacht tender, 10 feet by 50 inches, built by the Keystone Boat Mfg. Co. The boat is swung on davits, making it an easy matter to lower it into the



Romana is powered with an 80 h.p. Buffalo motor and attains a speed of 12 m.p.h.

ing Romana was to provide a boat which would be suitable for day cruising or for long ventures off shore should the owner's fancy incline that way. It was therefore necessary to arrange her so that the services of a paid crew could be dispensed with, while providing her with all the comforts of a home and making her the last word in seaworthiness.

Consequently the hull is stoutly built so that the boat may be capable of withstanding the roughest sea-way; the planking is of cypress, with mahogany trim above deck. On the bridge abaft an adjustable glass windshield is a specially constructed brass standard by which the control of the vessel is centralized. The steering mechanism is of the rack and gear type, and the gears are housed within the standard, while on top of it the compass is mounted, and within easy reach is a special quadrant to which the reverse, spark and throttle controls are carried. By this arrangement complete one-man control is obtained.

On the bridge is a long seat covered with mule skin and upholstered with a buoyant composition which makes the cushion an



The bridge of Romana, where centralization of control has been reduced to a science



The main saloon aft is connected with the galley by swinging doors. A companionway leads from the galley to the after deck, for it is the owner's intention of taking his meals on deck whenever the weather permits

water. The deck, both forward and aft, is furnished with willow chairs, each chair having a lower compartment which contains a life-preserved. A canopy extends from the windshield to the stern, and there are side curtains which make it possible on bad days to enclose the deck completely.

The forward companionway leads from the bridge deck to the owner's stateroom. This compartment is furnished with a full-sized berth with lockers beneath, a combination chiffonier and writing desk, and a settee which can be made up into a berth. There are also two full length clothes presses, while forward is a toilet room with running hot and cold water. Light is supplied by a transom skylight and four portholes.

The engine-room is directly be-

A Cruiser for Lake Erie

neath the bridge deck, entered by ladder from above and is separated from the rest of the boat by bulkheads. The main power plant is a 50-80 h.p. Buffalo engine with 6½-inch bore and 9-inch stroke. Mounted on the engine is a two-unit Leece-Neville electric starting system. Gasoline is stored in four sectional tanks having a combined capacity of 400 gallons located amidships in separate compartments. A pump attached to the main engine delivers fuel from any of the four tanks to two three-gallon tanks which are swung beneath the bridge. These tanks are kept continually filled by the pump, all surplus fuel flowing back to the tank from which it came. In this way gravity feed to the carburetor is assured under all conditions. In case of accident to the pump, pres-

sure can be obtained by opening the valves at the bottom of the large tanks.

A fifty-light 1 K. W. 32-volt Matthews automatic marine lighting system supplies the current for lighting the boat and running the electric fans, and for heating water, making toast, etc. In connection with the electric set is a belt-driven pump which is used for filling the fresh water tanks, for washing down decks and for draining the bilge in case of emergency. The lights are controlled from a switchboard on the forward bulkhead of the engine-room. Water for bathing is heated by means of a Lawson gasoline heater. The engineer's quarters consist of a berth, clothes locker, wash basin with hot and cold water, and toilet.

At one side of the foot of the companion-

MoToR BOATING for December, 1916

way leading from the bridge is a bathroom containing a full-sized tub and all the usual equipment. On the opposite side is a large storage room where supplies are kept. The companionway runs into the main saloon, which is also used as a dining room in bad weather. There are seats on each side upholstered in green plush with the carpets to match. Like all the compartments with the exception of the bathroom and galley which are done in white enamel, the main saloon is finished in mahogany. The seats at the side can be made up into very comfortable double berths when occasion requires. The saloon contains a buffet and a large locker in addition to the other fixtures.

Romana maintains a speed of 12 m.p.h.

Tech III, Limousine Express

Coleman du Pont's New High-Eight-Cylinder Sterling Engines—Central Cockpit for One-Man Opera-

EXTREMELY impressive in appearance whether at low speed or high is Tech III, the new 50-footer owned by T. C. du Pont. She was de-

Speed Day Cruiser Which Is Powered With Two Motor Controls, Gauges, Etc., Carried to Cention—Maximum Speed of 35 Miles Attained

Photographs by Levick

signed for him by Adolph Apel, and built by the Ventnor Boat Works, of Atlantic City, N. J., of which Mr. Apel is proprietor. With a beam of 9 feet and 2½-foot draft she is classified as a limousine express cruiser, her speed attaining a maximum of 35 miles per hour.

Tech III is constructed of white oak and white cedar with African mahogany for the stern transom, cabin and all trimmings. She is powered with two eight-cylinder 5½x6¾-inch Sterling motors, fitted with electric self-starters.

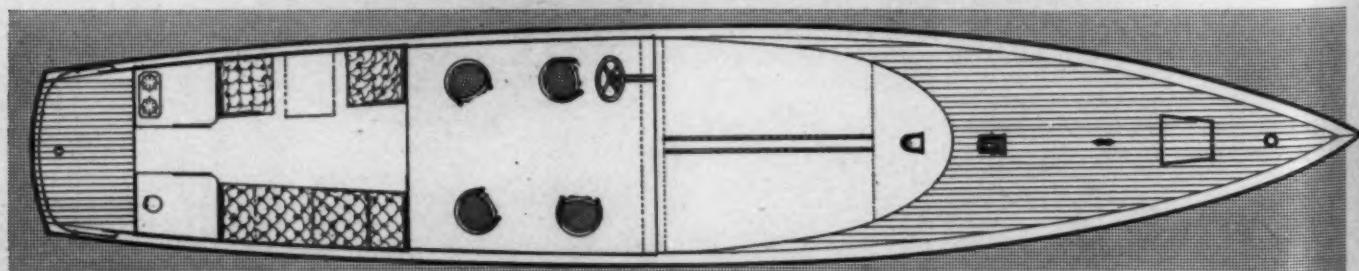
The boat is arranged with crew's quarters and engine-

The two eight-cylinder Sterlings are installed in a compartment forward of the cockpit

When Tech III gets under way she really moves

room forward and owner's cabin aft. In the bow is a six-foot compartment for chains and water tank, and abaft a bulkhead is the forecastle, with toilet, lavatory, berths, lockers, etc. The engine compartment comes next aft, and following it is a nine-foot cockpit with awning and side curtains and windshield in front.

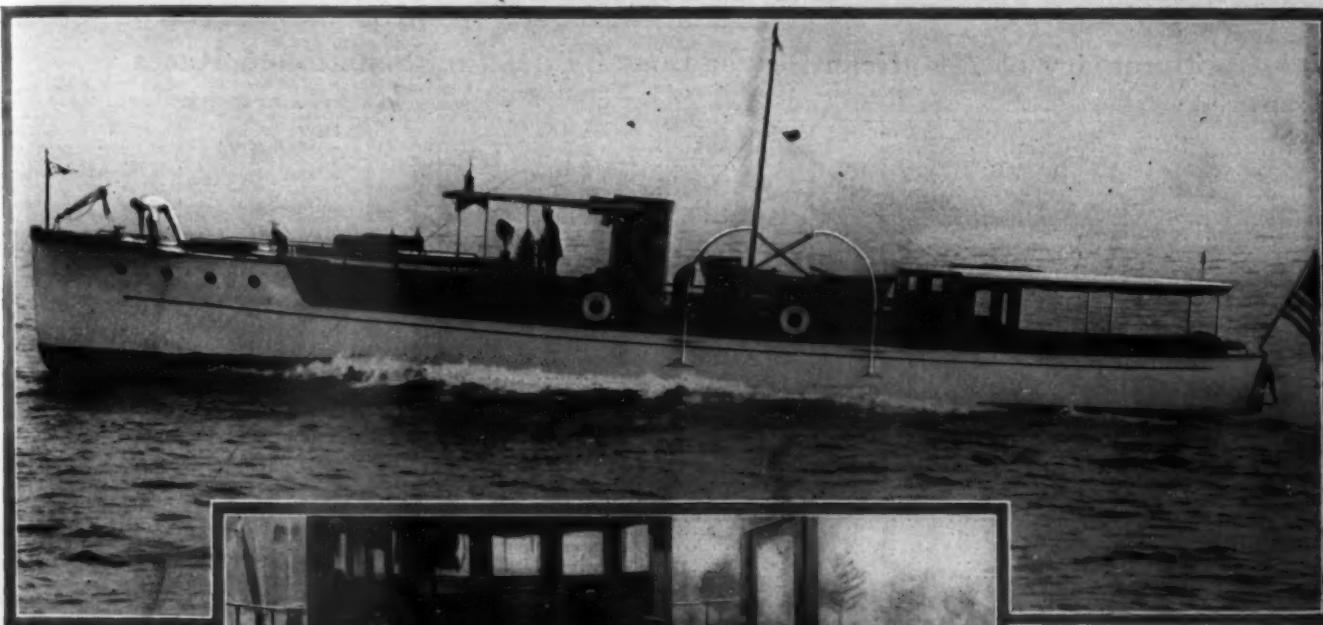
Going still further aft one finds a four-foot section in which is arranged a toilet on one side and a small galley opposite. The owner's cabin or saloon is seven feet in length and contains Pullman berths, folding table, etc. There is an after deck four feet in length.



Plan of Tech III. The engine exhausts are muffed through the stern transom, and cut-outs are provided on both sides. Four gasoline tanks are installed

A 76-Foot Express for the Lakes

Susanne, a Fast Cruiser of Unusual Seaworthiness and Accommodations—Heavy Substantial Construction Throughout, with Double Planking—Two Sterlings Give Speed of 26 M.P.H.



Doors on either side of the cockpit windbreak give access to the passageways alongside the cabin trunk

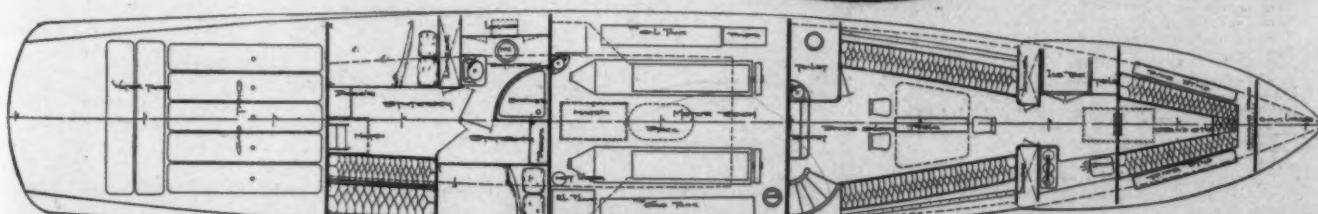
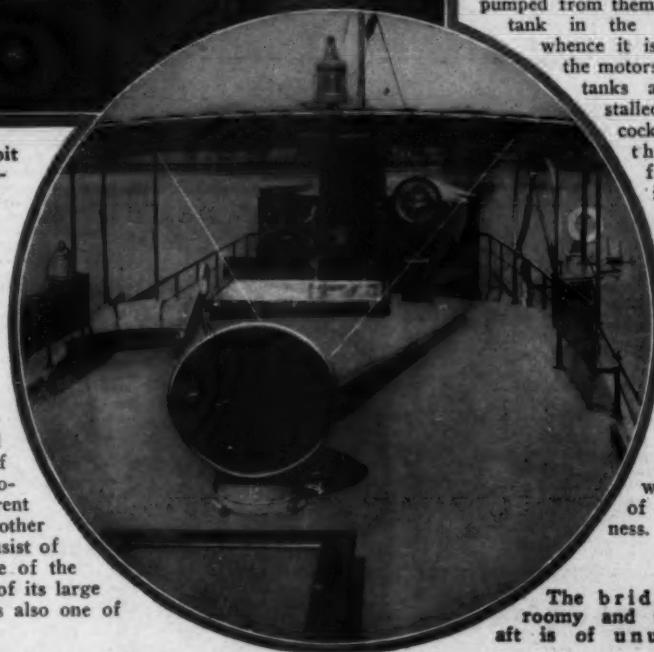
ONE of the larger express cruisers of the year is Susanne, owned by E. H. Close, a prominent real estate dealer of Toledo, Ohio. This boat affords ample accommodations and a speed of 26 m.p.h. The craft was designed and built by the Matthews Co., of Port Clinton, Ohio, and the power plant consists of a pair of 300 h.p. Model F Sterling engines, turning twin screws. The general arrangement of Susanne provides for crew's quarters forward, galley and dining saloon immediately aft, engines amidships, and owner's quarters aft. The forecastle gives accommodations for three men. The dining saloon is noteworthy for its size, the overall length being 13 feet and the extreme breadth 10 feet. Two extension transoms with pipe berth backs give emergency sleeping space in this room alone for four persons. The entrance hatch on the starboard side leads directly from the bridge. Eight large windows give excellent light and ventilation. The motor room is ventilated by means of ports, stack and sirocco fan. A 2 k.w. Matthews automatic lighting plant of 110-volt capacity provides current for operating the starting motors, electric lights and the other electrical devices on board. The owner's quarters aft consist of two double staterooms with connecting bath. A feature of the bathroom is a good-sized shower. The cockpit, because of its large size and excellent protection from wind and weather, is also one of

Susanne is a handsome Matthews cruiser owned by E. H. Close, of Toledo, Ohio

the noteworthy points of the design. The overall length is 15 feet and the width 11 feet. Doors are provided on either side of the windbreak for access to the passageways alongside the cabin trunk. Five gasoline tanks of 175 gallons' capacity each are installed under the cockpit floor, and the fuel is pumped from them to a gravity tank in the engine-room, whence it is supplied to the motors. The water tanks are also installed under the cockpit floor, but the receptacle for lubricating oil is placed in the motor compartment.

The main dimensions are, length 76 feet, beam 13 feet and draft 4 feet. Susanne is constructed with planking of double thickness.

The bridge deck is roomy and the cockpit aft is of unusual size



Susanne is laid out with crew's quarters forward, galley and saloon immediately aft, engine-room amidships and owner's quarters at the after end. Five fuel tanks of 175 gallons' capacity each are installed under the cockpit

MoToR BoatinG's Annual Review of Racing

Summary of American Power Boat Association Sanctioned Races

Name of Boat	Owner and Club	Distance, Nautical Miles	Club Holding Race	Class (Local)	Elapsed Time	No. of Cyls.	Bore & Stroke	R.P.M.	H.P.	L.W.L.	Area Bo M.S. Rating
Oriana	A. E. Luders, Stamford Y.	100	New York Athletic	Cruisers, 28'-50'	11:32:00	2	5 1/2 x 7	448	12.42	35.625	9.662 35.50
Cero	W. P. Frost, Columbia Y.	100	New York Athletic	Cruisers, 28'-50'	11:47:20	2	6 x 8	400	15.08	39.58	16.64 35.60
Edyl	A. Barrett, Colonial Y.	137	Colonial Y.	Cruisers, 28'-50'	23:24:10	2	4 x 6	485	6.10	28.17	8.98 27.54
Vision	G. L. Merrill, Seaside Park Y.	16.756	Barnegat Bay Sec.	Cruisers, all ratings	2:35:08	2	6 x 7 1/2	395	13.98	35.14	11.40 34.83
Maryn	R. Neims, Ocean City Y.	16.756	Barnegat Bay Sec.	Cruisers, all ratings	2:26:02	4	4 x 6	600	15.08	33.37	8.787 38.61
Bedouin	J. Levy, Riverside Y.	50	D. R. Y. R. A.	Class A, rating 30-40	6:06:24	4	4 1/2 x 5 1/2	576	18.71	43.16	17.98 34.16
Dora II	B. Aristoff, Riverside Y.	50	D. R. Y. R. A.	Class A, rating 30-40	6:48:44	2	5 x 6	440	8.64	29.66	9.51 30.67
Liwao	L. Sommer, Jr., Riverside Y.	50	D. R. Y. R. A.	Class B, rating over 40	5:40:21	4	5 1/2 x 6 1/4	510	25.24	38.57	12.97 41.31
Eva Dor	Robbins & Kirby, Riverside Y.	50	D. R. Y. R. A.	Class B, rating over 40	5:31:53	4	5 1/2 x 6 1/4	500	24.75	40.16	11.66 42.81
Spare Time	A. C. Wilson, Sea Cliff M. B.	61.12	Harlem Y.	Cruisers, 28'-50'	7:44:50						
Heather	J. H. Wallace, New York A.	61.12	Harlem Y.	Cruisers, 28'-50'	7:45:10	4	4 1/2 x 5 1/2	650	21.12	38.47	10.33 41.97
La Ola	G. C. Pardee, Oakland Y.	50.19	California Sec.	Cruisers	6:10:46						
Countess	W. H. Hand, Jr., New Bedford Y.	100	New York Athletic	Exp. Cruisers, 35'-70'	4:12:20	8	6 x 6	1375	155.49	39.58	5.98 98.30
Flyaway III	F. L. Upjohn, Huntington Y.	100	New York Athletic	Exp. Cruisers, 35'-70'	4:20:25	8	6 x 6	1100	124.50	37.83	9.59 88.00
Countess	W. H. Hand, Jr., New Bedford Y.	140	L. I. Sound Sec.	Exp. Cruisers, 35'-70'	6:21:13	6	6 x 6	150	141.38	39.58	5.98 95.24
Flyaway III	F. L. Upjohn, Huntington Y.	137	Colonial Y.	Exp. Cruisers, 35'-70'	7:13:41	8	6 x 6	1100	124.50	37.83	9.59 88.00
Daneva II	C. H. Strecher, Sea Isle City Y.	16.07	Barnegat Bay Sec.	Exp. Cruisers, all ratings	0:54:38	6	5 1/2 x 6	890	71.37	37.146	5.747 76.10
Echo III	C. Beadenkopf, Seaside Park Y.	16.07	Barnegat Bay Sec.	Exp. Cruisers, all ratings	0:59:02						
Daneva II	C. H. Strecher, Sea Isle City Y.	52.536	Barnegat Bay Sec.	Exp. Cruisers, all ratings	3:06:24	6	5 1/2 x 6	890	71.37	37.146	5.747 76.10
Fame	F. A. Nathan, Island Heights Y.	52.536	Barnegat Bay Sec.	Exp. Cruisers, all ratings	2:45:04	4	5 1/2 x 6	1280	60.82	34.32	4.59 76.73
Caddy II	B. Zahn, Independent Y. & B.	61.12	Harlem Y.	Exp. Cruisers, 35'-70'	2:40:40	8	6 x 6	1250	141.38	39.50	6.19 94.25
Oriflame	H. S. Gurney, New York A.	61.12	Harlem Y.	Exp. Cruisers, 35'-70'	4:03:50	6	5 1/2 x 6 1/4	1040	80.52	49.94	8.99 71.74
Betty M. II	B. W. Kotcher, Detroit Y.	10	M. D. P. B. A.	Exp. Cruisers, scr. race	0:35:56	8*	5 1/2 x 6	....	....	59.50	Not measured
Venetian Maid	L. W. Tuller, Detroit Y.	10	M. D. P. B. A.	Exp. Cruisers, scr. race	0:36:31	8*	5 1/2 x 6	....	....	59.50	Not measured
Grey Hound	L. Steinhouse, Phila. Canoe	50	D. R. Y. R. A.	Open Boats, all ratings	3:00:52	4	4 1/2 x 6	920	24.28	24.458	2.19 68.13
Raven	J. Levy, Riverside Y.	50	D. R. Y. R. A.	Open Boats, all ratings	3:39:34	4	3 1/2 x 5 1/2	1050	21.26	28.57	2.26 66.44
Mermaid	P. C. Hansen, Riverside Y.	50	D. R. Y. R. A.	Glass Cabin, all ratings	5:03:03	4	5 1/2 x 6	400	19.00	38.08	10.98 39.64
Wahnetah	W. Leech, Anchor Y.	50	D. R. Y. R. A.	Glass Cabin, all ratings	5:14:53	2	5 1/2 x 6 1/4	555	13.74	30.55	6.88 40.05
Dot & Jim	R. Williams, Ocean Gate Y.	13.87	Barnegat Bay Sec.	Open Boats, rating under 40	2:30:24	1†	4 1/2 x 5	505	4.46	18.50	3.54 31.57
B. V. O.	B. V. Ogden, Island Heights Y.	13.87	Barnegat Bay Sec.	Open Boats, rating under 40	2:13:32	2†	3 1/2 x 3 1/2	736	6.75	14.07	2.73 37.80
Selma II	G. J. Strauhmuller, Sea Isle City Y.	16.644	Barnegat Bay Sec.	Open Boats, rating over 50	0:53:41	3†	4 x 4	....	21.05	17.10	2.40 59.54
Snap Shot	R. K. Pearce, Island Heights M. B.	16.644	Barnegat Bay Sec.	Open Boats, rating over 50	1:11:56	4	3 1/2 x 4	1148	14.72	15.20	1.97 53.38
Nymph	L. Eisenlohr, Corinthian Y. of Cape May	26.268	Barnegat Bay Sec.	Dis. Racers, all ratings	1:13:55	6	5 1/2 x 6	....	95.05	Not measured	45.18
Hawk Eye	Lake George Syn., Lake George Y.	28.7153‡	Thousand Islands Y.	Hydroplanes under 40'	2:14:43	8	6 x 6	....	Not measured for rating		
Peter Pan VII	Simpson & Bickell, Columbia Y.	28.7153‡	Thousand Islands Y.	Hydroplanes under 40'	2:41:05	8*	5 1/2 x 6 1/4	....	Not measured for rating		
Miss Minneapolis	Miss Minneapolis Boat Assoc.	30‡	M. D. P. B. A.	Hydroplanes under 40'	2:07:48	8	5 1/2 x 6 1/4	....	Not measured for rating		
Miss Detroit	Miss Detroit P. B. A.	30‡	M. D. P. B. A.	Hydroplanes under 40'	2:10:43	8	5 1/2 x 6 1/4	....	Not measured for rating		
Miss Minneapolis	Miss Minneapolis Boat Assoc.	30‡	{ Six One-Mile Dashes }	M. D. P. B. A.	Hydroplanes under 40'	0:01:05.03	0:01:09.2	8	5 1/2 x 6 1/4	....
Miss Detroit	Miss Detroit P. B. A.	30‡	{ Six One-Mile Dashes }	M. D. P. B. A.	Hydroplanes under 40'	0:01:06.2	0:01:09.7	8	5 1/2 x 6 1/4	....
• Two engines. † Two-cycle. ‡ Three heats.					0:01:09.7	0:01:09.3	8	5 1/2 x 6 1/4	....	

• Two engines.
† Two-cycle.
‡ Three heats.

Winners of the Speed Boat Events

Event	Winning Boat	Length of Course	Motor and Power, 1916 Winner	WINNER'S SPEED (S.M.P.H.)					
				1916	1915	1914	1913	1912	1911
Mississippi Valley, Class A	Ugly Duckling III	5	Pierce-Budd—30	*24.8	*22.5	*24.1	*26.2	*27.5	
Mississippi Valley, Class B	P. D. Q. V.	5	Johnson—60	*29.4	*32.8	*28.2	*24.1	*26.2	*27.5
Mississippi Valley, Class C	1st heat, Hazel II	10	Fox—30	26.2	36.25	*32.5	*28.1	*34.3	*28.8
Mississippi Valley, Class C	2nd heat, Hazel II	5	Johnson—60	30.8					
Mississippi Valley, Class D	1st heat, P. D. Q. V.	15	Johnson—60	*31.2	*34.5	*30.4	*37.0	*35.8	*27.0
Mississippi Valley, Class D	2nd heat, P. D. Q. V.	7 1/2	Johnson—60						
Mississippi Valley, Free-for-All	Sterling—250	10	Sterling—250	*44.0	*39.2	*37.0	*44.7	*34.8	*32.0
Wrigley Trophy Race	Event not held in 1916.				*54.33		*42.0	*38.5	
Chicago Half-Mile Dashes	Not held in 1916.				60.77a				
Gold Challenge Cup	Miss Minneapolis	30‡	Sterling—250	50.0	*48.5	*50.49	*44.5	*36.8	*32.6
A. P. B. A. One-Mile Dashes	Miss Minneapolis	1m	Sterling—250	61.083a	*54.46	*51.8a			
Mississippi Valley Half-Mile Dashes	Miss Minneapolis	1/2	Sterling—250	59.97a	*54.54†	*48.0†	*53.7†	*38.7†	
Pacific Coast Free-for-All	Vogler Boy III	20	Sterling—250	21.21	39.0	*24.2	*38.4	*32.9	
British International Trophy	Event not held in 1916.								
National Carnival (Unlimited Class)	Races not held in 1916.								
Buffalo Races	Races not held in 1916.								
Hydroplane Championship, South Jersey	Race not held in 1916.								
Hydroplane Championship, Delaware River	Race not held in 1916.								
Mile Championship, South Jersey	Race not held in 1916.								

† Race not held.

‡ Speed in fastest race of heat races.

§ Nautical miles.

¶ Average, Admiralty conditions.

** One-mile instead of half-mile course in 1912-1915 inclusive.

The Long Distance Cruiser Handicap Events

Event	Winning Boat	Length of Course	Elapsed Time	WINNERS OF FAST TIME PRIZES					
				1916	1915	1914	1913	1912	
Philadelphia-Bermuda	734n	1							
Baltimore-Camden	368 1/2n	1							
New York-Albany and Return (Cruisers)	Edyl	270	38:10:00						
New York-Albany and Return (Open Boats)	Edyl	270	25:24:10						
New York-Cornfield L. V. and Return (Cruisers)	Edyl	137n	7:13:41	25:24:10	14:46:50	18:44:23			
New York-Cornfield L. V. and Return (Exp. Cruisers)	Flyaway III	137n	4:12:00	Flyaway III	7:13:41	No express cruiser class			
Countess	100n	11:32:00	4:12:00	Countess	4:12:00	No express cruiser class			
New York-Block Island (Exp. Cruisers)	Oriana	100n	6:14:03	Oriana	11:32:00	5:40:20	10:10:00	10:30:00	10:45:00
New York-Block Island (Cruisers)	Bedouin	54n		Helma	5:32:13	7:55:55	8:50:38		
Record Trophy	178				17:33:04	17:46:27	17:26:42		
Delaware River Y. R. A.		115n				13:09:30	11:20:00		
Pacific International									

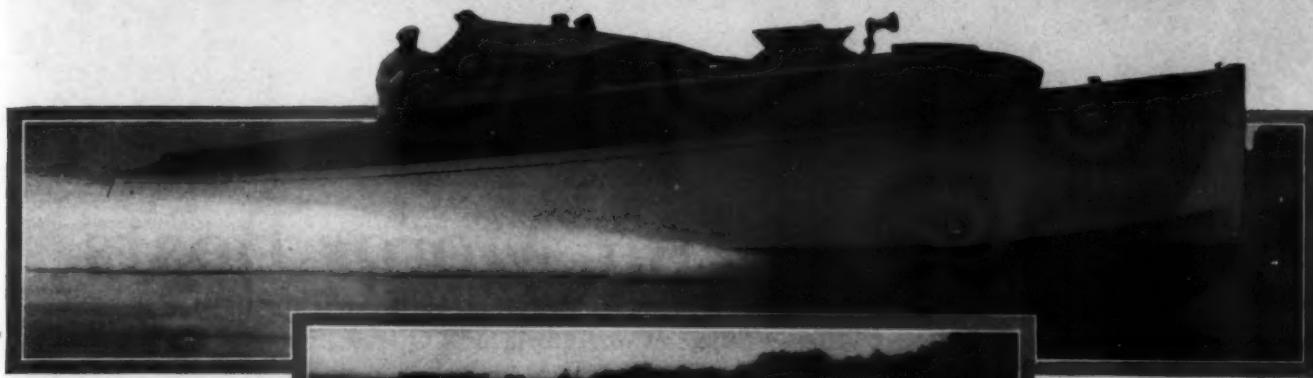
† Race not held.

‡ Nautical miles.

§ Course shortened this year.

Makers of History in 1916

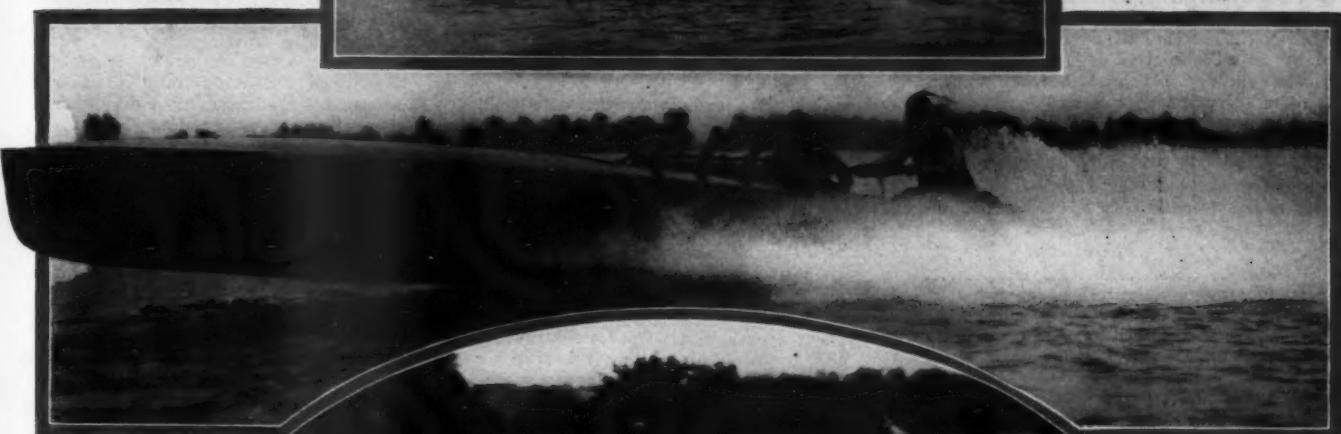
A Few of the Craft Which Have Left Their Mark on the Season's Racing Record—A Pictorial Review of the Exponents of Speed and Consistency in the Latest Crop of Motor Boats



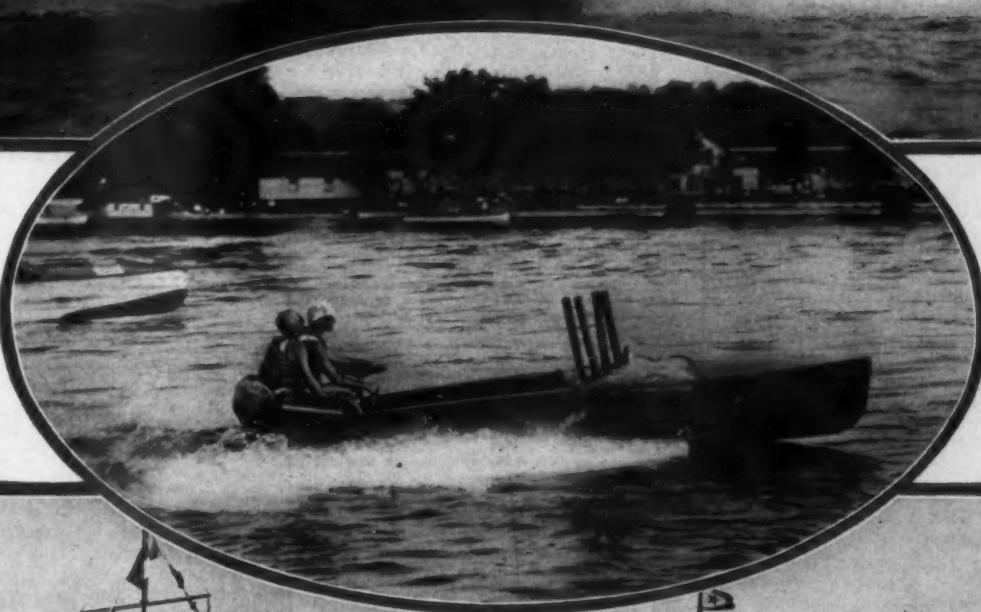
Countess, the unbeaten express cruiser champion of 1916. In the New Bedford race, for a distance of 86 miles, she maintained a speed of $29\frac{1}{2}$ m.p.h. Countess is a Hand V-bottom, owned by the designer and powered with an 8-cylinder Van Blerck



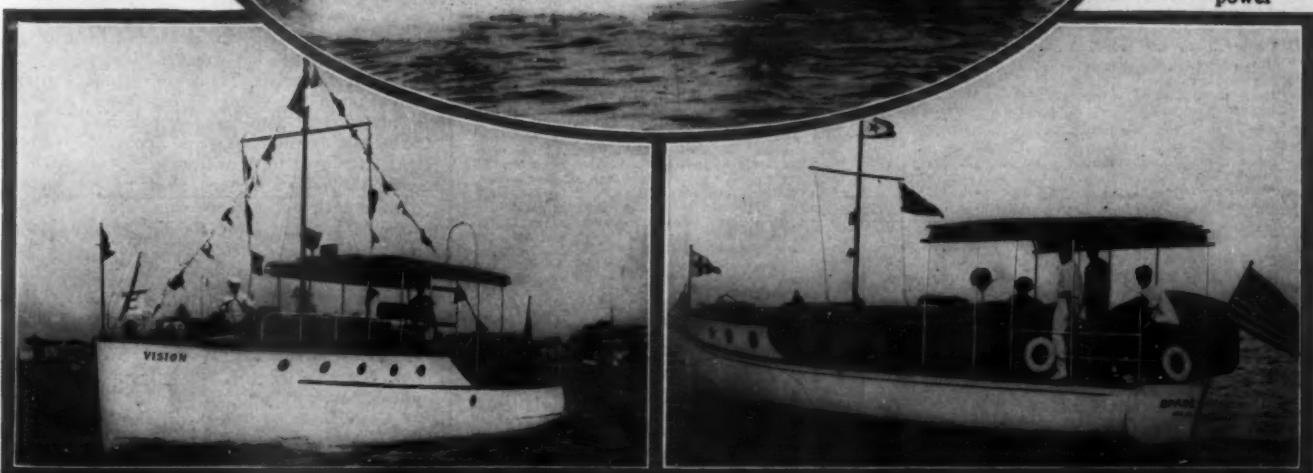
Miss Minneapolis is the fastest thing afloat, winner of the Gold Cup, and holder of the A. P. B. A. title of speed champion. In six one-mile dashes at Detroit she averaged, under Admiralty conditions, 61.063 m.p.h. She is powered with a 250 h.p. Sterling motor



Consistency is a jewel missing from the diadems of most of the speed rulers of the sea. However, Hawk Eye possesses it, and through it won the Thousand Islands Championship Trophy. She always runs true to form



P. D. Q. V., owned by Dr. A. C. Strong, is the season's most successful winner in restricted class racing. While not especially fast, her speed-power ratio is excellent, and she demonstrates what may be done with limited power



Vision, of the Seaside Park Yacht Club, is one of the bright stars of the Barnegat firmament, competitor in many of the season's events, and winner of two sanctioned cruiser races. Her owner is G. L. Morill, and her motor a Buffalo

Spare Time competed in nearly every event on Long Island Sound last summer, and was the only motor boat participating in the Inter-Club cruise on the Sound. Her owner, A. C. Wilson, is a sportsman of the blood royal



Cost Systems for Motor Boats

Accurate Record of Expenditures Helps to Keep Your Boating Outlay Within Proper Limits and Provides Valuable Talking Point When a Sale Is Contemplated—Question Various Interpreted

THE PRIZE CONTEST—Answers to the First Question in the October Issue

Reduced to the Hour Basis

(The Prize-Winning Answer)

A NY cost system to be useful and intelligible must get down to a unit basis; otherwise it leads nowhere. So many dollars spent per season, divided under a half dozen or so heads, means little or nothing. In the case of the motor car there is no argument but that the unit should be the mile. However, in the case of the motor boat the number of miles covered is not quite so easy to determine and I believe the hour unit is equally satisfactory.

Second, the cost system will be carefully kept in inverse proportion to the trouble required to keep it. Provide a small box in your boat into which you can slip a card for every trip, upon which card is noted the following:

Date	
Hours use	
Fuel	gals. at.....
Oil	" "
Misc.	

Number of guests

Following is a sample balance sheet, which every one should be able to make up at the end of the year. You will note that this covers the entire cost of operation, interest and depreciation. If you are in any way concerned over the cost of owning your boat, you must consider the entire cost or else you may expect one day to have a worn-out boat and no money with which to replace it. This is considered a very serious matter in business and is usually called "going into the hands of a receiver." You surely do not want to allow one of your best means of pleasure to go into the hands of a receiver. The best way to avoid it is to keep a cost system, which at least tells you approximately what each hour's operation costs.

YEARLY BALANCE SHEET

INVESTMENT

Cost of boat.....	\$1,000.00
Extra equipment.....	100.00
First cost.....	\$1,100.00
Added equipment during year.....	25.00
	\$1,125.00
Depreciation, one yr. 20%.....	220.00

Value of investment end of year..... \$905.00

Fixed Charges:

Interest, taxes and insurance 10%..... \$110.00

Depreciation 20%..... 220.00

A—Total Fixed Charges..... \$330.00

Running Charges:

Fuel.....

Lubricants.....

Lighting.....

Docking.....

Winter Storage.....

Misc Supplies.....

B—Total Running Charge.....

Average Per Hour.....

Repairs and Renewals:

Painting.....

Repairs.....

Overhauling hull.....

Overhauling equipment.....

C—Total Repairs and Renewals.....

Total Cost of Operation = A plus B plus C.

Average Cost of Operation Per Hour =

A + B + C

Total No. Hours

Data
No. days in water; days in actual use; hours of operation; gals. of fuel; gals. of motor oil; guests accommodated.

LOUIS R. LEE, Columbus, O.

When you send in your answers you must state what you will take for a prize should you win one

The Loose-Leaf System

MANY persons seem to think that motor boating for pleasure should be entirely free from routine. Perhaps this explains why so much marine machinery is kept in such poor condition. However, this attitude is held not only toward the routine entailed by the care of the hull and power plant but also toward cost keeping.

Once started, however, the boat owner will take a keen interest in this work, provided he starts aright.

Records may be made in a pocket note-book, but this system either requires an extra note-book or the mixing of boat notes with others. A "stationary" cost book may be used, but the drawback here is the tendency to neglect entering items until they are forgotten. A combination of these two methods would give satisfactory results, but entails the notation of each item twice, which makes the task laborious.

What is needed is a means of making notes at the time when purchases are made or bills paid and systematically getting rid of these notes, so that, while ready for reference whenever wanted, their bulk will not be bothersome. The following method is such:

Questions for the February Issue

1. What arrangements have you made, and what precautions have you taken to assure a clean and quiet running boat?

Suggested by L. R. L., Columbus, Ohio.

2. Describe, and illustrate if necessary, a satisfactory method of cutting limber holes in floor and engine bed timbers where they were omitted at the time of construction.

Suggested by W. E. M., Philadelphia, Pa.

3. Describe, and illustrate if necessary, the installation of wiring in a small cruiser, paying particular attention to accessibility, and protection against damage, moisture, and oil.

Suggested by A. J. S., New York City.

Rules for the Contest

Answers to the questions, addressed to the Editor of *MOTOR BOATING*, 119 West 40th St., New York, must be (a) in our hands on or before December 20th, (b) about 500 words long, (c) written on one side of the paper only, (d) accompanied by the senders' names and addresses. (The name will be withheld and initials or a pseudonym used if this is desired.) Questions for the next contest should reach us on or before the 20th of December. The Editor reserves the right to make such changes and corrections in the accepted answers as he may deem necessary.

The prizes are: For each of the best answers to the questions above, any article advertised in the current issue of *MOTOR BOATING*, of which the advertised price does not exceed \$25, or a credit of \$25 on any article advertised in the current issue of *MOTOR BOATING* which sells for more than that amount. (There are three prizes—one for each question—and a contestant need send in an answer to but one if he does not care to answer all three.)

For each of the questions selected for use in the next contest, any article advertised in this issue of *MOTOR BOATING* of which the advertised price does not exceed \$5, or a credit of \$5 on any article advertised in this issue of *MOTOR BOATING* which sells for more than that amount.

For everyday notes a loose-leaf note-book is the most desirable, except in special cases, since the fillers may be preserved. Two of these note-books will be required. The one which is carried regularly in the pocket may have the last two or three leaves devoted to boat costs, thus requiring no extra space about the person.

Even if you have a yacht with a payroll, these pages will last you some time and when filled they have merely to be placed in the overflow note-book in your desk or boat where they form a permanent record that, if desired, may be replaced at leisure by typewritten copy.

The extra note-book should be divided into several departments, namely, Hull, Equipment, Repairs, Care and Supplies.

Not only does this system inform you of what you are spending, but furnishes a record of dates when painting was done, tells whether economy devices are really economizing, and when alterations were made or equipment added—all of which information is often highly desirable.

R. W. HUESTIS, Springfield, Mass.

Classify Accounts Separately

THE classification shown here was used by the writer during the construction of a 25-foot runabout, and while it is not very elaborate it successfully performs its duty—which is all that could be asked of it.

I. CONSTRUCTION

A. Materials
B. Plant and equipment
C. Labor

II. OPERATION

A. Fuel and oil
B. Batteries

III. MAINTENANCE

A. Improvements
B. Repairs and overhauling

The major expenses to be considered were construction, operation, and maintenance. As subdivisions under Construction came the items of Materials, Tools and Equipment, and Labor; the last being an interesting and instructive item sometimes lost sight of. This covered only the number of hours worked and was later used to figure the labor cost. These were the only divisions used by the writer, though each expenditure was extended in the account book in more or less detail, so that the cost of any item could be readily obtained. This made the work more simple than if a separate account were opened for items such as framing, planking, etc.

The second major division is Operation, in which the writer has grouped Fuel and Oil, and Batteries as the two principal expenses, not having any rent to pay for Boat House or Club Dues. Another division (II-C) can be opened to take care of these if circumstances necessitate.

Maintenance comprises the third and last



division and this covers the usual items of Improvements and Repairs.

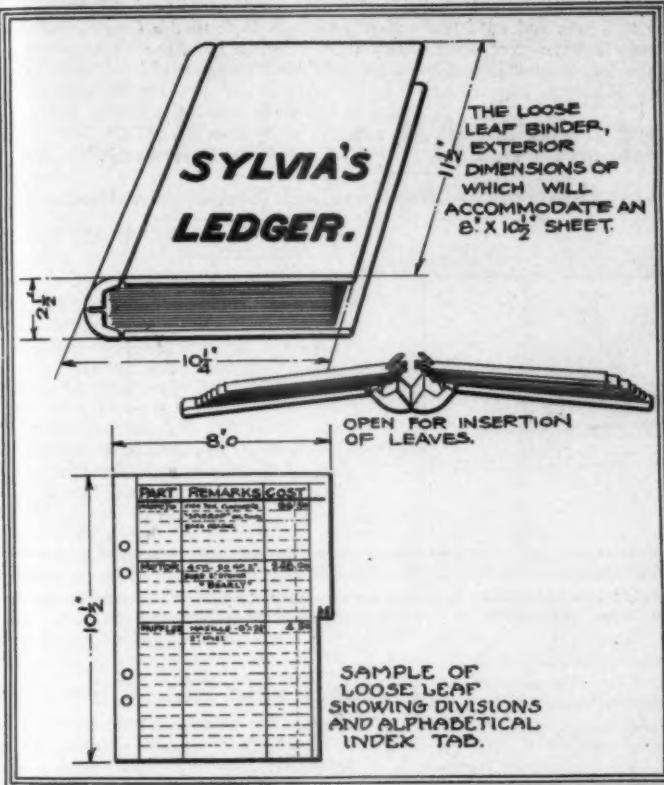
In the classification shown it will be noted that each account has an individual number, as I-A, I-B, or II-C, etc. No charge is made directly against Construction, Operation or Maintenance, as

per roller after being passed over the writing board as shown. The paper is introduced, after the rollers are in position, from the back, this being the cover side of the box.

One strip may be used for keeping a record of supplies, while the other may serve for construction items. Of course, if preferred, one or even three sets of rollers may be utilized and entries made to suit the individual.

When an entry is made the amount should always be added to the total column. In this way the amount of expenditures for the season may be read at a glance.

J. F. C.,
Meriden, Conn.



According to G. A. L., the loose-leaf method of cost keeping commends itself for its flexibility and its simplicity

each expenditure must be placed in the subdivision in which it belongs.

The writer found it better to keep all these accounts in one book rather than separately, and used a couple of pages for the Materials Account (I-A) and others for accounts I-B and I-C. Upon completion, this account was closed, and the sum of the three divisions (I-A, I-B and I-C) gave the cost of the boat placed in the water.

The other two divisions, Operation and Maintenance, are still running and it surely is satisfying to be able to tell with some certitude (dependent on how closely you keep your account) just how much it costs to keep the motor boat germ appeased.

J. F. K., Brooklyn, N. Y.

Eliminating the Trouble Factor

THE drawings show a device to assist in keeping account of expenditures—when hung in the cabin it is a constant reminder to make entries. It is always accessible, and soiled or wet hands need not interfere with the use of it. The device is made of a large cigar box of the long type. Two pairs of rollers turned up or made of broom handles are mounted as shown in the section (Fig. 2). A partition runs through the middle of the box and forms a support for the inner ends of the two pairs of rollers.

The end of the paper strip is pasted to the lower roller of a pair and the paper rolled on to it. The other end is then stuck to the up-

per roller after being passed over the writing board as shown. The paper is introduced, after the rollers are in position, from the back, this being the cover side of the box.

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J. F. C.,
Meriden, Conn.

tion entries which are specified by two or more different designations will lessen the amount of searching to find any special items. Any number of general items related in an indirect way to the expenditures may be conveniently filed in it. These include sketches, receipts, bills, etc., and a special compartment or place should be assigned for them.

The binder and sheets of a size suitable may be procured at any paper goods or stationery store at a very reasonable cost. These sheets are suitable for making small drawings or sketches such as owners frequently require, when installing features of their own design.

Methodical procedure should be used in making entries and the book kept at some convenient place, preferably at home.

If neatness and accuracy are used in compiling this ledger it will serve its purpose in supplying definite data or information of all sorts relating to the operation of the boat.

G. A. L., Washington, D. C.

Sale Value Increased

ACCURATE records of amounts expended for construction, operation and maintenance, along with other miscellaneous information, have a distinct value for motor boat owners as evidence for future reference, inasmuch as this data is available for estimates in future constructions, and for determining the actual cost of maintenance, while it is also useful in making a sale.

If it is desired to record each individual item which represents a separate expenditure, some system should be employed that will minimize the time, thought and attention needed to register the different items and make them available for ready reference when the occasion arises.

Having in view elimination of needless preparatory work, I suggest the use of a loose-leaf binder, which I have found to be the most adaptable and convenient type of book or file for easy arrangement and concise indexing of each page.

Any number of entries may be made in this form by the insertion of additional sheets where an alphabetical index is used, and a supplementary index for materials and opera-

Book-Keeping by the Card Index System

FOR some time I experimented with various methods of keeping track of expenses incurred in operating my boat, dallying with fifteen-cent pocket note-books, loose-leaf note-books and the like, but deriving no satisfaction from them. Finally I determined to try the card index system and so purchased a bunch of ruled index cards and a set of tabs. These I kept in their drawer where they are always on hand when wanted. They are not in such a form as to make it a temptation to shove them into the nearest pocket.

The first tab is marked Hull, and after it follow cards containing figures and items showing every cent spent on the hull, what it was spent for and why. Then follow—Engine, Steering Gear, Propeller, Ignition, Gasoline, Oil and Miscellaneous. Each of these sections has its cards and figures.

In addition to this cost section the file goes on and shows all the data I have found out concerning my own boat, its performances, etc., and data concerning certain other craft in which I am interested.

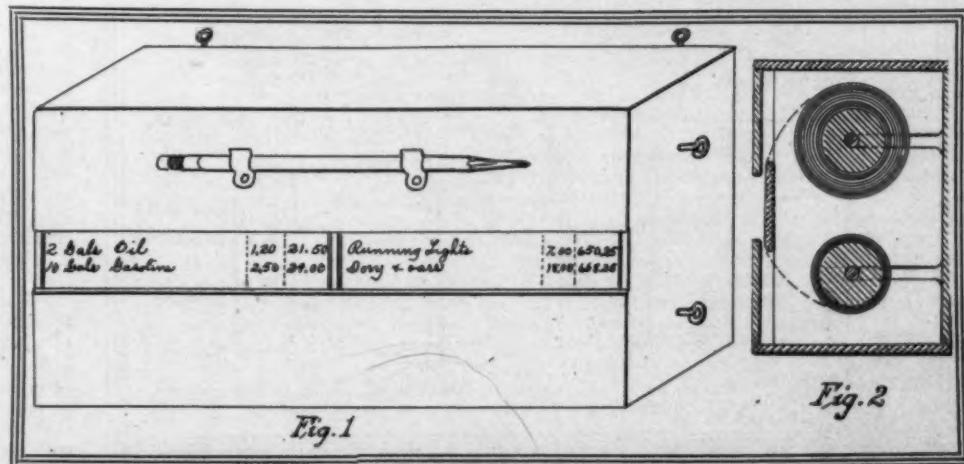
The advantages which I have found in this system are:

First—The cards are substantial, and are not easily torn or damaged like a sheet of thin paper.

Second—They are cheap and an unlimited supply may be obtained at any stationery store.

Third—The only place they really fit is in their own drawer, and they are, consequently, always at hand.

HOWARD H. BELL,
Schenectady, N. Y.



Contrivance suggested by J. F. C. for keeping the record of expenditures up to date with the least tax on time or memory

Your Storm Curtains

How to Arrange Them So That They May Be Fastened Down in a Hurry and Rolled Up
With the Least Amount of Trouble—Shrinkage of the Wet Canvas an Item to Be Considered

THE PRIZE CONTEST—Answers to the Second Question in the October Issue

Lacing the Curtains

(The Prize-Winning Answer)

THE ordinary way to fasten the side curtains of a boat top is to use Murphy fasteners or baby snaps. The trouble with this method is that it is impossible to get the curtains on tight and snug. If they are fitted tight when dry, they will likely tear when wet, whereas, as they get old they stretch badly.

The following method has worked out well on my own boat. The curtains are laced both at the top and bottom, the lacing being tight on top, but slack at the bottom, and the edges of the curtains fastened to each other with Murphy fasteners.

The curtains have a row of grommets four or five inches apart both at top and bottom (though Murphy fasteners are preferable at the top if the curtains are to be taken off to let the top down, etc.). The side curtains are in two pieces to facilitate rolling up, and because it is sometimes very convenient to have only the front half down. They are laced tightly and permanently at the top, and the rear half is lapped three inches in the inside of the front half and fastened together with four or five Murphy fasteners. On the bottom the lacing is put in loose with enough slack to allow hooking over the screw eyes. The lacing is knotted on the end to keep it from being pulled out.

To fasten the curtains to the coaming, get some good large brass screw eyes and open them up just enough to slip the lacing through. These are better than hooks as the line will not unhook so readily when slack. Hook the line over the eyes loosely and then draw it up tight from the end and tie a bow knot to keep it from slipping back.

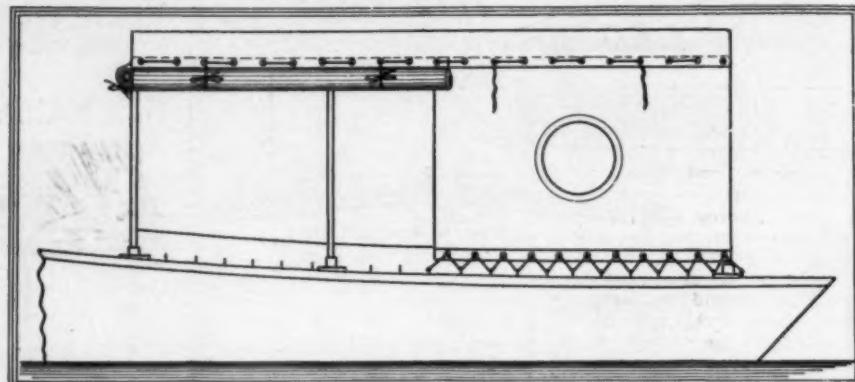
This gives you an adjustable fastener which will always keep your curtains trim and tight,

and will take less time to fasten and unfasten than any other fasteners I have ever tried. Use cotton line for the lacing and if laced neatly it will add to the shipshape appearance of the boat.

The end curtains are put on in the same way, care being taken to make the front one lap

after which go back to the front, reroll tight and tie. I never have the slightest trouble doing this, blow or calm, and can do it in the time it takes to tell it. I tried rods on the bottom but took them off again as they were a nuisance and unnecessary.

J. APPLETON, Port Washington, Wis.



Mr. Appleton advocates the use of lacings, top and bottom, to allow for stretching or shrinkage of the curtains. Economy of time is also an impressive element with this arrangement

around on the outside of the side curtain, and are fastened with Murphy fasteners as before. When putting down the curtains, commence with the front one and then work back down the sides. In this way you can always reach around on the outside and use two hands, which is a great help when you are in a hurry.

To roll up the curtains I tie reef points through the top grommets, two to a curtain or four on a side, and roll up one-half at a time. Roll up one end, tie it loosely with a reef point, then roll up the other end and tie it,

Detachable Side Curtains

THE side curtains herein described have proven by five seasons' successful use: first, that they are easily put up and taken down; second, that they never become unfastened; third, that they can be stowed in an easily accessible and out-of-the-way place.

The side curtains are made in one piece with strip of hard pine $1\frac{1}{2}'' \times \frac{1}{2}'' \times 9'$ long (the length will vary with that of the cockpit) fastened to the top and the outside as shown in detail B. The canvas is riveted to the wood at the forward and after ends and at the seams, but copper tacks are used between.

The top of the hard pine strip is chamfered to make it shed water.

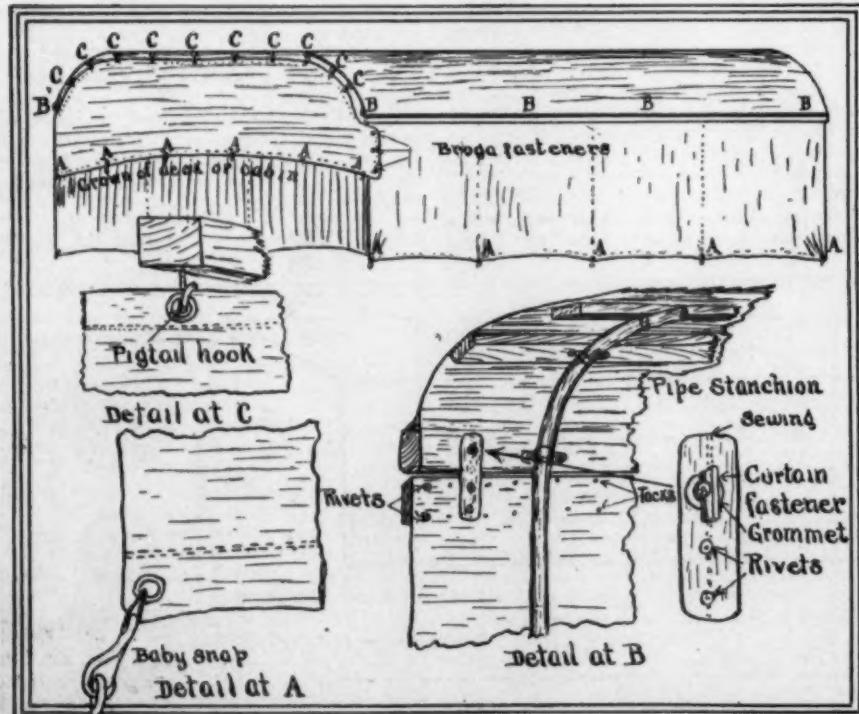
Eight straps are made of canvas (first cut in one piece 36 inches long, stretched, divided into eight equal parts and finished) riveted to the top piece as shown in detail B. At the top of the strap is a No. 2 grommet that fastens over a curtain fastener of the type shown to the right of detail B. This fastener is screwed to the wooden strip that passes through the hem of the awning.

The forward curtain is made to lap over the side curtain and fasten to it with patent fasteners. A stern awning, if one is necessary, is similarly made and fastened.

The rest of the diagram is self-explanatory. The side curtains when taken down are rolled up around the top pieces of hard pine and slung to the under part of the awning with canvas straps, one end tacked to the carlin and the other fastened into a screw eye with a baby snap. The bottom edge of the awning thus presents a clean-cut appearance.

JAMES E. MURPHY, New London, Conn.

[Perhaps it would not be amiss to repeat here the formula for water-proofing canvas—for curtains, no matter how tightly fastened are useless if they do not resist water: In a gallon of warm gasoline, dissolve a pound and a half of paraffin wax. When the mixture is thoroughly homogeneous, apply it to the canvas with a paint brush. In a few hours the gasoline evaporates, leaving the pores filled with the paraffin.—EDITOR.]



Mr. Murphy's curtains also have the merit of simple manipulation and the added advantage of being readily detachable

Roller Curtains with Ratchet Lock

ALMOST any kind of motor boat with a roof or awning over it has or at least should have some form of side curtains to protect the interior from the elements, and to keep out the rain and spray when running in bad weather. How often have you run past the club mooring after a good blow and noticed curtains flapping around and sometimes missing?

If we could use a common window curtain roller on which to roll the curtain, and fasten it down with a stick across the bottom we would have a curtain most easily handled and held in any position, but unfortunately curtain rollers are not made with brass springs and small parts. The iron parts used would soon rust and destroy their usefulness. However, we can adapt the same principle to our curtains and secure good results.

Curtains should be made of water-proof duck, full width, with the selvage on each edge. A hem on the edge would cause trouble in rolling up. The roller should be not less than $1\frac{1}{2}$ inches in diameter and the brackets will have to be long enough to allow the curtain to roll up. These brackets may be made to clamp around the pipe stanchions or fasten to a wood strip as found most convenient.

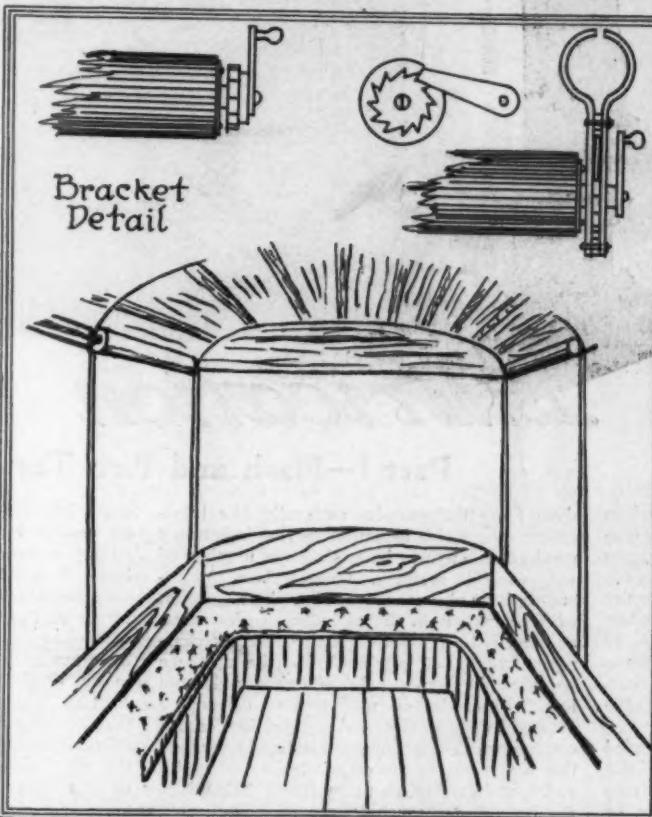
One end of the roller is fastened with a round-head screw, and the other end will have a ratchet and pawl attachment to hold the curtain rolled up or keep it pulled taut when down. (See illustration.) The ratchet is soldered to a short piece of pipe and the pawl fastened to the bracket in the position shown. A small crank or hand wheel is fastened outside the bracket and will serve to wind up the curtain in place of the spring. A long, heavy screw through the pipe will hold all this firmly to the roller and a plate may be soldered to the pipe and screwed to the roller for extra strength.

Across the bottom of the curtain is sewed a hard wood slat $\frac{1}{2}$ x 1 inch to hold the curtain out and to fasten it down. A grommet is put in it at each end of the stick, and, if the curtain is long, one or more are spaced between. In the coaming or deck railing either screw eyes or patent fasteners may be used. The screw eye requires a long grommet; the eye being turned after hooking. The hook will be satisfactory with round grommets, or round head screws will answer. When the curtain is all hooked, a notch or two strain on the ratchet will stretch out the former, thus preventing the fastenings from becoming loosened.

Guides could be made to fasten to the bottom stick and slide on the pipe stanchions. A set-screw in each guide would hold the curtain securely in any

position, or pins could be set vertically in the stanchions and screw eyes used in the ends of the stick to serve in place of guides. It should not be necessary to mention that all fittings and small parts should be brass; the roller of course is wood, varnished.

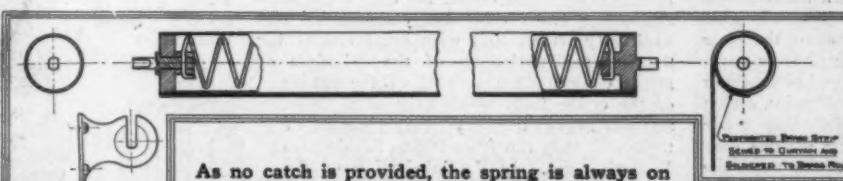
Fastening the last curtain will not prove troublesome if it is hooked first, the roller adjusted and then unhooked. After the others are all fastened you can easily climb outside and hook down the door.



Mr. Moores puts forward the suggestion that curtains suspended from ratchet rollers and hooked at the bottom will meet all requirements

The construction may require modification to suit certain conditions, but the same general idea can be applied to any curtain, large or small, by using a little head work in connection with the tools.

W. B. MOORES, Newburgh, N. Y.



As no catch is provided, the spring is always on tension, keeping the curtain from flapping

Brass Roller and Spring Advised

THE drawings show a method of attaching curtains which is very similar to the manner in which house shades are hung. The roller is made of brass tubing about one inch in diameter. The drawing shows how brass plugs are fitted and soldered to the ends and how the spring is retained. There is no ratchet action, the tendency at all times being to roll the curtain up. This keeps it tight when drawn down and hooked to the gunwale or coaming. Brass should be used

throughout, including the spring. The roller may be supported in standard brackets as shown. Standard eyelets and fasteners are used at the bottom of the curtain and at the sides when the edges come in line with the top supports. Space these rather closely.

To fasten the edges of the several curtains together, ordinary snap fasteners may be attached. All these fasteners are listed in the catalogs of motor boat supplies. An advantage of this construction lies in the fact that the use of celluloid windows is unrestricted as they will not be injured in manipulating the curtains. It is strictly a one-man proposition. Another advantage is that the curtains on either side near the bulkhead may be drawn in a moment as a protection against spray. In case the top of the boat has well-rounded corners, one or even two narrow curtains may be used at these points.

F. A. YOUNG, Meriden, Conn.

Curtains Stretched on Frames

CURTAINS are a feature of unusual comfort during cold and stormy weather, providing as they do, protection from the elements, housing not only the occupants of the craft, but the mechanical and delicate electrical mechanism as well.

Curtains provided with celluloid lights may be ruined during one season's use, yet with proper care the delicate pyralin will remain serviceable for several seasons. This material, if one desires to retain its usefulness without cracking, should not be rolled, for rolling invariably causes it to break. A folding frame constructed of light materials, preferably drawn brass wire, as this resists corrosion, is not difficult to construct and will prolong their life indefinitely. The material of which the curtains are made, rubber or enameled cloth, should occasionally be gone

over with the dressing sold for this purpose, and celluloid or pyralin which has become scratched may be renewed by an application of acetone varnish.

Fasteners for securing the curtains in place are cheaper to purchase than to make, but the actual construction of the frames which close and fold the curtains and placing of the celluloid windows is not difficult as these parts are merely sewed.

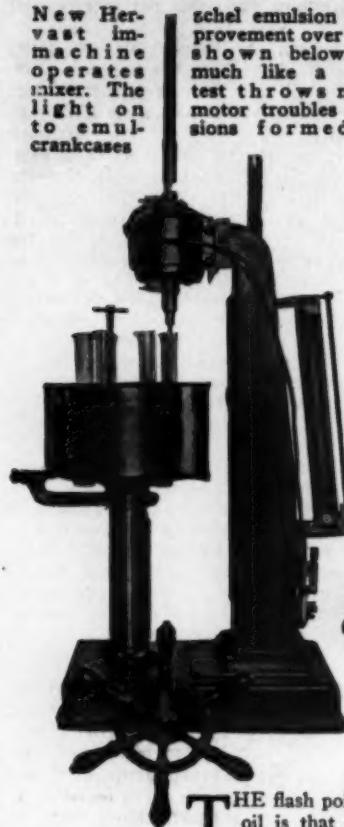
Curtains should not be stowed when they are wet, because the dampness will soon decay the canvas, and care should be used in handling them in cold weather for the celluloid is brittle and is liable to break.

Too much emphasis cannot be placed upon the need of folding this material.

G. A. L.,
Washington, D. C.

New Her-
vast im-
machine
operates
mixer. The
light on
to emul-
crankcases

schel emulsion machine a
provement over the simple
shown below. It
much like a soda
test throws much
motor troubles due
sions formed in

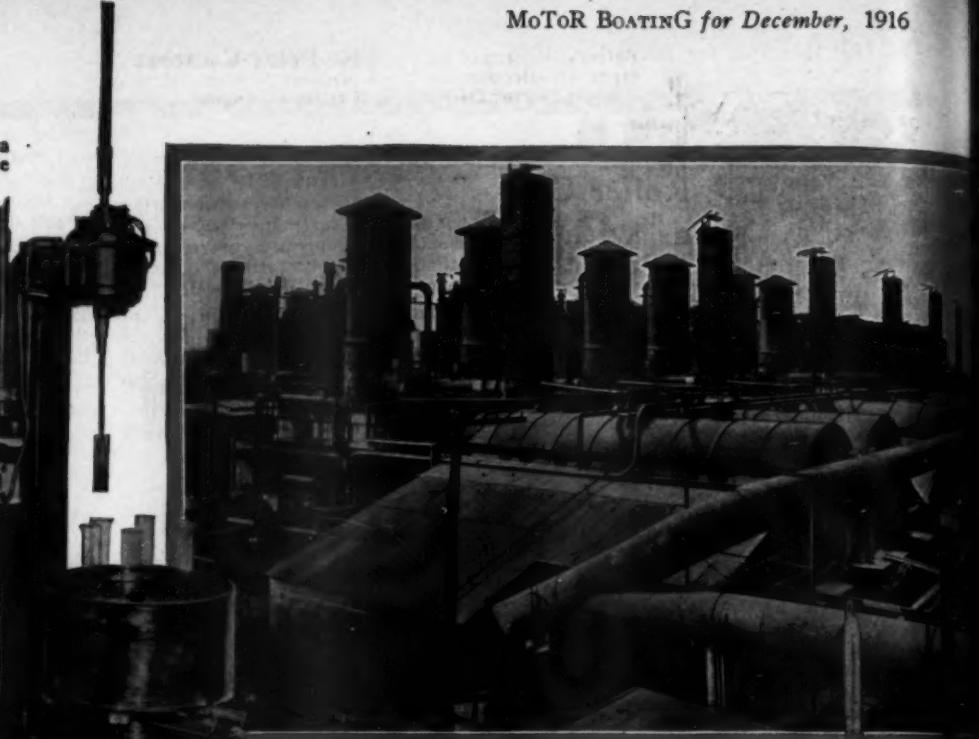


THE flash point of an oil is that temperature at which, upon being heated, it emits a vapor that will flash upon application of a small flame, and the fire point is the temperature at which the oil, when heated, will support combustion. By some of the technical engineers who from time to time have written upon the general subject of oils, these tests have been considered very important.

Originally, flash and fire tests were included in the examination of products, especially burning oils, in order to prevent oils from being made that under ordinary storage or working conditions would cause fires. Very little use is made of these readings in the process of refining oils, as they do not generally act as a guide in standardizing a product. The readings are valuable only in giving assurance that the finished product is uniform and contains none of the lighter distillates that might get into it by accident.

Crude oils vary in the property of giving a high or low flash point to a finished product. Paraffin crude from the northern fields allows of the production of high flash point oil. Oils made in the same manner and having the same physical characteristics, but refined from paraffin crudes from the mid-continent or southern fields do not have as high a flash point, owing to the peculiarity of the crude. Oils made from Russian crude or from the various continental petroleums vary in a like manner, the lowest flash point oils being produced from the Russian crude. In this country what are known as the asphaltic, or the southwestern and western crudes, produce oils of low flash point, while, with the exception of gravity, the other physical characteristics, such as body, color and odor of the finished product might be quite similar to those of oils made from the Pennsylvania crude. Although it is possible to make oils of exactly the same viscosity and color from all of the various crudes mentioned, the flash point of each of the finished oils will vary through a considerable range.

Quite naturally there has always been a considerable effort made by those particularly interested in northern paraffin oils to emphasize the importance of flash point. In the course of a number of years that belief has undergone considerable change, owing to the rapid strides made by the refiners of the southern crudes. These refiners have been able to pro-



Lubrication In Refining

Part I—Flash and Fire Tests

duce from their crudes unusually fine lubricating oils, which in actual service in internal combustion engines have shown a number of very valuable features. One of these, for instance, is an absence or greatly reduced amount of free carbon in the cylinders, such carbon as there is being of a decidedly different character from that produced by the northern paraffin oil. Further, the oils produced from low flash crudes do not seem to decompose as rapidly under internal combustion engine conditions. The proof of this lies in the fact that the low flash oils do not leave carbon deposits, and further, that they retain their working body for a much longer period—that is, they do not break down under the extremely severe conditions of operation in internal combustion engine service.

It is interesting, in considering the subject of flash and fire points of oil, to note the development that has taken place from the time of the first testing of internal combustion engines. Such engines were introduced at a period when steam engine practice was well developed, and cylinder stocks were being made from Pennsylvania crude, the only crude then available. These oils were compounded and used very widely and with good results for the internal lubrication of the cylinders of steam engines. On account of the nature of the crude from which they were made, and due also to the very heavy viscosity of these oils, they ran from 500 to 700 degrees F. flash point. In the lubrication of the first internal combustion engine the engineers considered the temperature due to explosion of the gas to be very high, probably in the neighborhood of 2,000 degrees F., and that this high temperature necessitated a lubricating oil which would not vaporize when placed in the cylinder under high heat conditions. Owing to the thickness of the cylinder walls and consequent lack of effectiveness of the cooling water, the internal temperatures of the early engines were much greater than those of the present day type, although the temperatures of the explosion would be about the same as at present. Thus the lubrication engineer in the early stages of the gas engine development had a more difficult problem confronting him than we have today.

With hardly an exception, every

early internal combustion engine had its power cylinders lubricated with either compounded cylinder oil or heavy flash cylinder stock; and it was very much regretted by the manufacturers of the engines and the oil men who were interested that they did not have available oils having flash points in the neighborhood of 1,500 degrees F., and it was actually considered at that time, as many of the older engineers in the business can remember, that the flash point was the one feature of prime importance.

It soon developed in the practical work of lubricating these engines that a small multitude of difficulties was caused, directly traceable to the carbon-forming properties of these heavy cylinder oils when used under high,

Below: Simple emulsion machine which shakes water and oil in same container.



Above: Electric hot plate test for making rapid determination for sulphur compounds in oils. Good oil may darken in color after heating but remains clear

Batteries of crude oil stills equipped with different types of selective, aerial condensing towers. It is here that the refining of crude oil begins



Various Phases

W. F. Parish

Manager, Lubricating Division, The Texas Co.

Right: Saybolt universal viscosimeter, an instrument which measures the viscosity of oils. A burner E heats the oil in the cylinder B to the temperature at which viscosity is to be taken, and the stopper D removed. Simultaneously a stop watch is started and the time taken for a given amount of oil to flow through the small opening F is recorded. The time taken for the oil to flow is called the viscosity. The Saybolt is the type of viscosimeter used extensively in this country, but other instruments are also employed

dry heat conditions. In the attempt to prevent recurrence of these troubles, lighter bodied oils were eventually used, until the heavier grade engine oils were established almost entirely for this class of work.

During the years that followed the lubricating oil requirements of gasoline engines were being very closely observed, and a great many very interesting experiments were made with oils of all characters. It was found as general rule that of the oils then available, those having a combination of high viscosity with low flash would give unusually good results. Even in the first days of internal combustion engine lubrication operators could be found who would give voice to the then radical statement that an oil was wanted that would disappear completely when it worked over into the combustion chamber; and that if high flash had anything to do with an oil remaining, so

A durability oven used in studying the decomposition of oils due to heat exposure and in judging relative durability and stability. The oven gives an electrically heated air bath, the temperature of which is kept constant automatically

that partial distillation would take place, resulting in coking or carbonizing, high flash was not required for this particular service.

Notwithstanding the occasional light that was given the subject by thoughtful engineers, the commercial interests of the paraffin oil manufacturer influenced him to maintain that high flash was the requisite quality of an oil for power cylinder work. Only a few years back a number of controversies between the advocates of various oils took place in the technical journals, the discussion being practically centered about this very interesting point of the vaporizing temperature of an oil. The field at that time seemed very unequally divided between the advocates of the high and the low flash point oils. The specifications issued by the Society of Automobile Engineers some years ago favored the high flash point principle, and undoubtedly the action of this society influenced the opinion of quite a number of engineers connected with the motor industry, and that may have led to the belief that high flash was of more importance than the facts would seem to indicate.

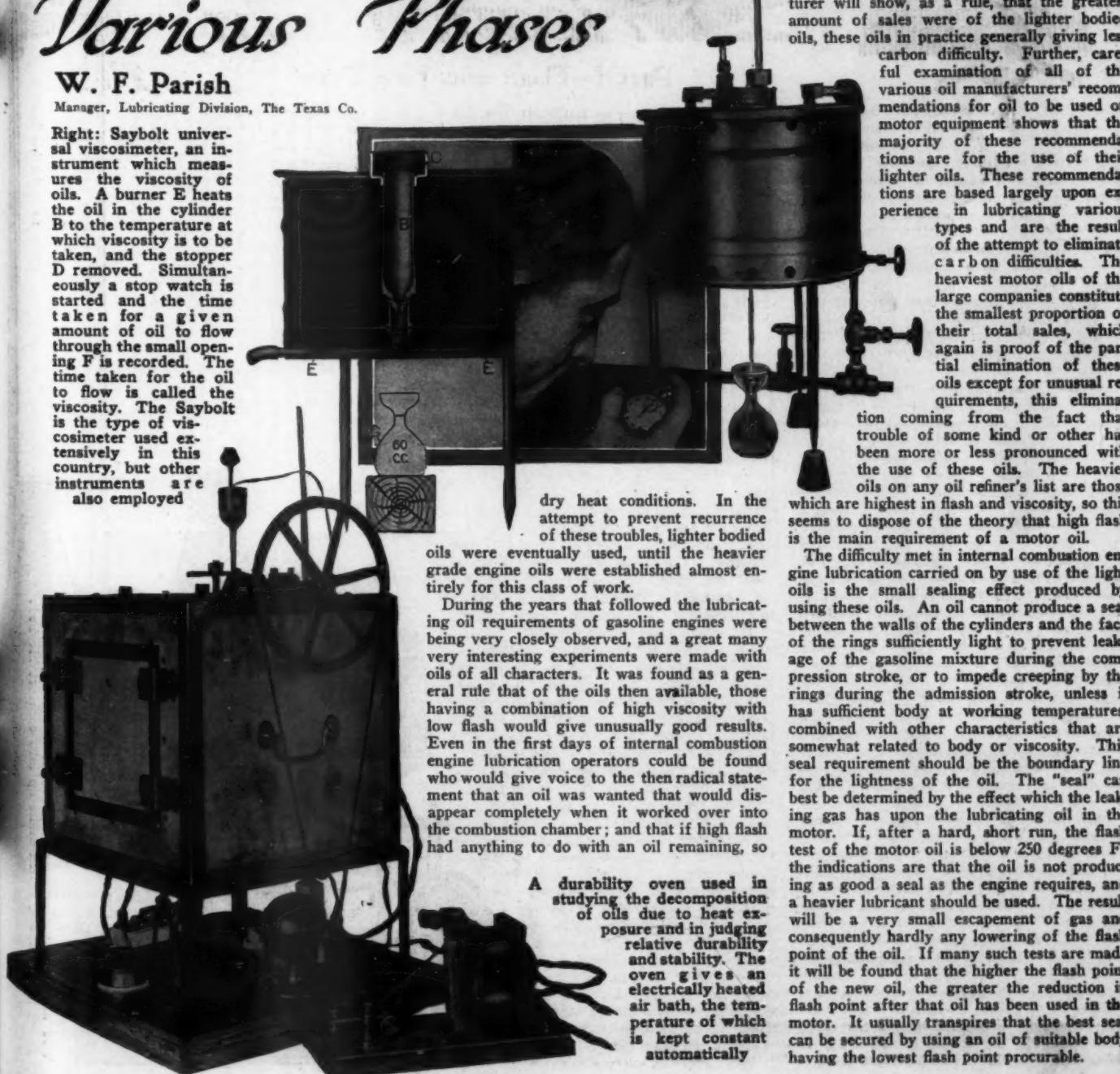
If we examine the motor oil business in its development during the past ten years we shall get a very good idea as to exactly what has taken place in the minds of the oil manufacturers. After it was definitely decided that cylinder stocks could not be used for internal combustion cylinder lubrication, lighter oils were gradually placed in this service. Finally, in an attempt to overcome carbon difficulties, the oils recommended for this class of work were what are generally known to the trade as heavy spindle oils.

The marketing record of any oil manufacturer will show, as a rule, that the greatest amount of sales were of the lighter bodied oils, these oils in practice generally giving less carbon difficulty. Further, careful examination of all of the various oil manufacturers' recommendations for oil to be used on motor equipment shows that the majority of these recommendations are for the use of their lighter oils. These recommendations are based largely upon experience in lubricating various

types and are the result of the attempt to eliminate carbon difficulties. The heaviest motor oils of the large companies constitute the smallest proportion of their total sales, which again is proof of the partial elimination of these oils except for unusual requirements, this elimination

coming from the fact that trouble of some kind or other has been more or less pronounced with the use of these oils. The heavier oils on any oil refiner's list are those which are highest in flash and viscosity, so this seems to dispose of the theory that high flash is the main requirement of a motor oil.

The difficulty met in internal combustion engine lubrication carried on by use of the light oils is the small sealing effect produced by using these oils. An oil cannot produce a seal between the walls of the cylinders and the face of the rings sufficiently light to prevent leakage of the gasoline mixture during the compression stroke, or to impede creeping by the rings during the admission stroke, unless it has sufficient body at working temperatures, combined with other characteristics that are somewhat related to body or viscosity. This seal requirement should be the boundary line for the lightness of the oil. The "seal" can best be determined by the effect which the leaking gas has upon the lubricating oil in the motor. If, after a hard, short run, the flash test of the motor oil is below 250 degrees F., the indications are that the oil is not producing as good a seal as the engine requires, and a heavier lubricant should be used. The result will be a very small escapement of gas and consequently hardly any lowering of the flash point of the oil. If many such tests are made it will be found that the higher the flash point of the new oil, the greater the reduction in flash point after that oil has been used in the motor. It usually transpires that the best seal can be secured by using an oil of suitable body having the lowest flash point procurable.

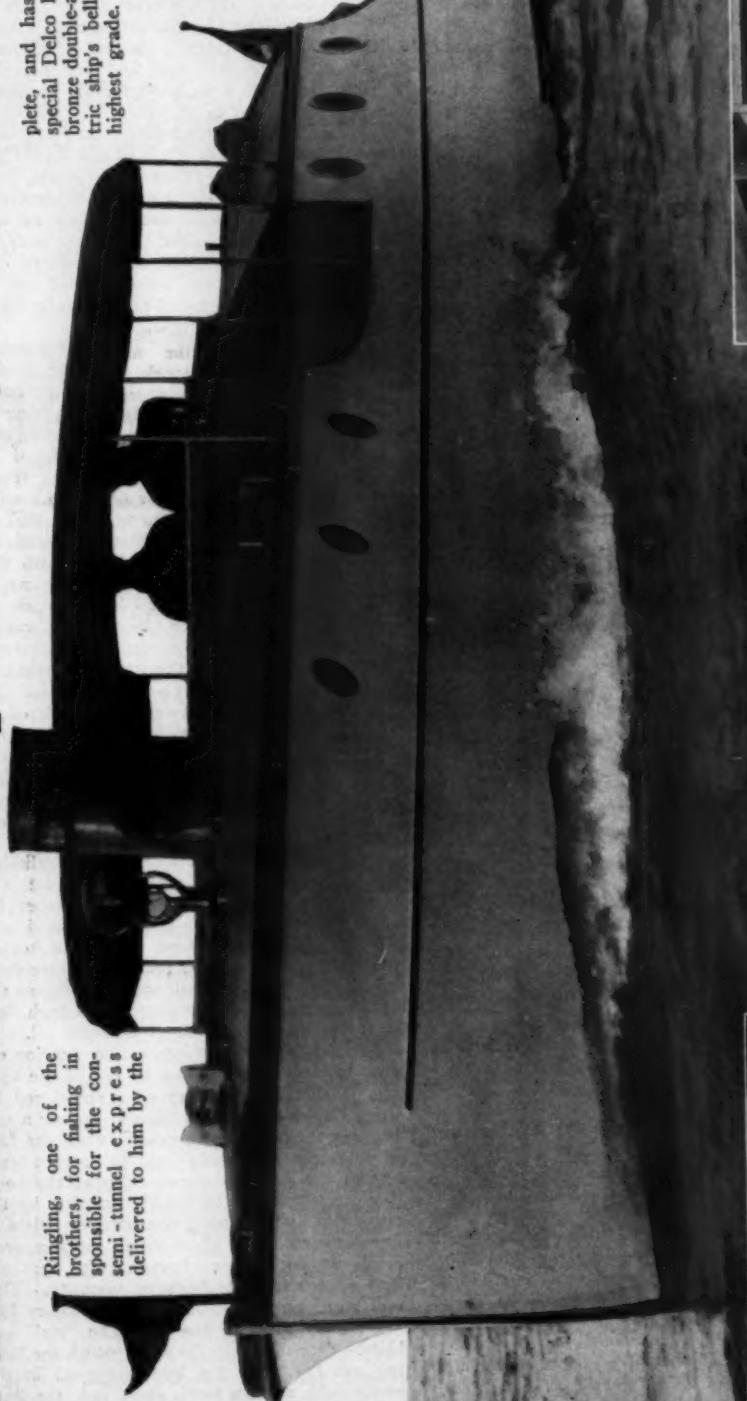


A Semi-Tunnel Cruiser with Speed, Strength and Seaworthiness

THE enthusiasm of Henry Ringling, one of the original seven Ringling Florida waters, is responsible for the construction of a shallow-draft cruiser which has just been delivered by the Great Lakes Boat Building Corp., of Milwaukee, Wis. While the appearance of the boat is along the lines of the military type express cruisers which have been delivered by the builders, the draft has been reduced to 23 inches by semi-tunnel construction, which is remarkable.

plete, and has included such equipment as a special Delco light plant, seven-inch searchlight, bronze double-acting windlass, electric fans, electric ship's bell, clock, and other fittings of the highest grade. The cruiser, with its mahogany trim throughout, attractive upholstering and special fittings, represents one of the finest boats that has been turned out this year.

Salome, as she is called, will be put in immediate service for cruising and fishing in the shallow rivers and waters in Florida.



Ringling, one of the brothers, for fishing in the semi-tunnel express delivered to him by the



The after cabin or owner's stateroom is provided with extension type seats, which make up into comfortable beds

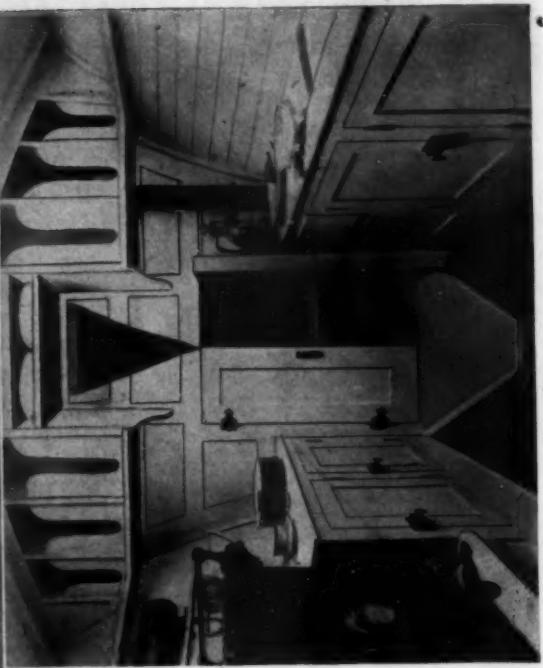
"Salome, a 43-foot Great Lakes semi-tunnel express cruiser which has been built for Henry Ringling. She is remarkable alike for her structural strength, her shallow draft and her high speed

able considering that the boat has sleeping accommodations for a party of six and a speed of 22 m.p.h. with an eight-cylinder Van Blerck.

Although only 43 feet in length, four compartments are provided: crew's lavatory, galley, main cabin and owner's stateroom, each with full headroom throughout, besides a commodious bridge deck and inviting cockpit. Structurally, the boat is extremely strong without excessive weight, as the hull is designed for sawed frames, steam-bent ribs and battens running from stem to transom, all spaced on short centers. There are two water-tight bulkheads which add not only safety, but also strength and rigidity. The hull throughout is salt-water-fastened with brass screws and copper rivets.

The engine, located under the bridge, is completely housed and protected, and yet each part is made instantly accessible by means of specially designed removable hatches built in sections. All controls are carried to the steering columns for one-man operation. The deck makes a comfortable lounging place, as it is provided with two upholstered seats and can be entirely enclosed by side curtains in inclement weather.

Mr. Ringling has spared no effort to make his boat very com-



The galley forward is unusually complete, having a large icebox, two-burner range with oven, sink and ample locker space

Prompt Deliveries Certain for 1917

The Scarcity of Raw Material During the Past Year Greatly Handicapped the Marine Engine Industry—Conditions Now Much Improved—Early Ordering Advisable

By Charles A. Criqui
President, Sterling Engine Co.

LIKE all other industries having to do with the production of machinery, the marine engine business has been very seriously handicapped for the last twelve months, because of the uncertain status of the steel market. Deliveries of raw products have been delayed and prices have soared to dizzy heights, while tremendous efforts on the part of the manufacturers have been necessary to bring about results. In spite of this disquieting condition, however, the year now drawing to a close has been one of unprecedented success and, along with increased sales, there has been a marked betterment in the quality of the engines manufactured.

I can well remember when, in the early days of the industry, a motor having a bore and stroke of, say, $5\frac{1}{4} \times 6$ inches, was considered suitable for service in any type of boat, be it cruiser, work boat or racing craft. Given a respectable piston displacement, it was not deemed necessary to pay much attention to rotative speed, bearing sizes, balance or the like. In the matter of bearing surface particularly, engineering science was quiescent, and power-giving improvements were made from year to year without the slightest increase in bearing sizes. Nor did the diameter of the crankshaft and other working parts change as horsepower was added to the motor. As a result, the parts were overworked, and engine failures were not infrequent.

But within the last two years the industry has advanced in a truly wonderful fashion. To-day one goes into the market and finds marine motors with large diameter crankshafts of special steel, heat-treated; large bearing surfaces on the crankshafts and connecting rod pins; larger camshafts and camshaft bearings; heat-treated drop forgings in place of castings, and improved cooling and oiling systems. The up-to-the-minute motor, moreover, carries with it refinement, reliability and ease of operation which were undreamed of a few years ago. Counterbalanced crankshafts provide smoothness of operation and lengthen the life of the

bearings; indicators and gauges show the amount of oil and the pressure under which it is working, and all working parts, including the starting motor and the flywheel are enclosed. In a word, we now have engines that can be put in service and kept there indefinitely



The writer, who is an authority on matters pertaining to the marine engine industry

with an absolute minimum of worry and trouble. There is one provision contingent upon satisfactory service, however: The owner must select the motor that is best suited to meet his individual requirements—there must be no inclination to make a cart horse do the work of a trotter or vice versa.

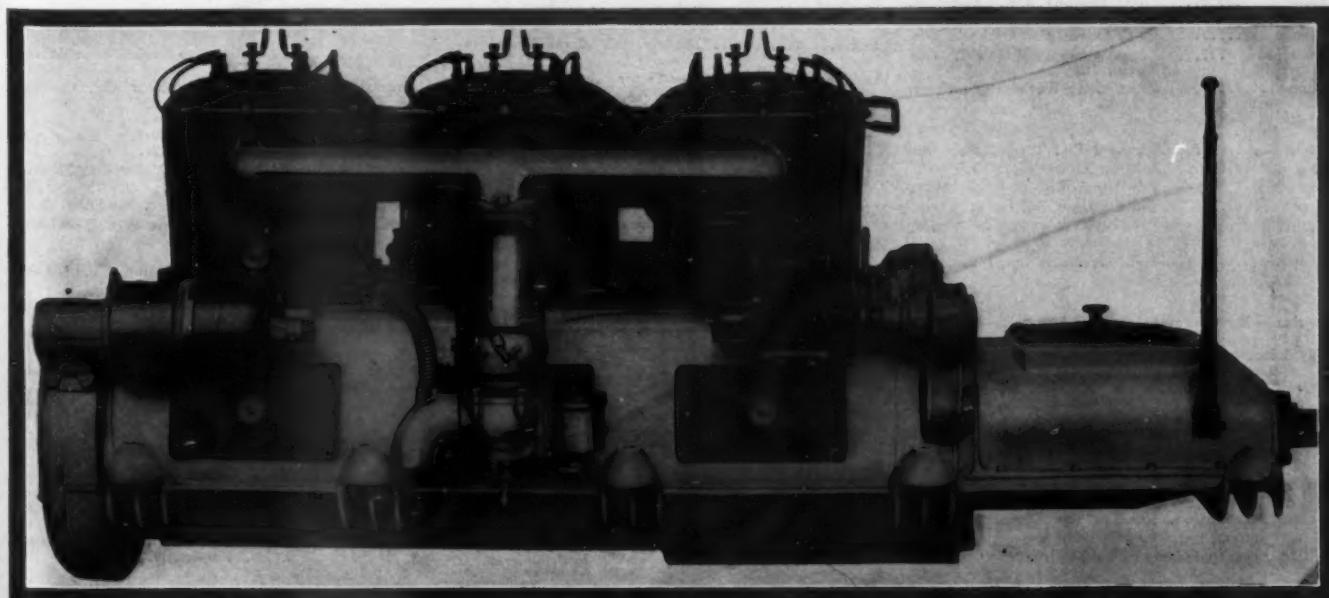
With respect to our own company on this point it may be interesting to cite the capa-

bilities and limitations of what is known as our Model F motor. This machine is built in four, six and eight cylinders, and has a bore of $5\frac{1}{2}$ inches and a stroke of $6\frac{3}{4}$. It is manufactured for three distinct types of services, and the different models are variously designated as F-H, F-M and F-S. The H model is a heavy-duty machine and is designed, fitted, timed, etc., to give the best results at from 400 to 600 r.p.m. Features of its design include long pistons of low compression, heavy flywheel and large lower base of iron, permitting the installation of a big and heavy clutch and reverse gear. In addition the ignition system, including the magneto and distributor, is selected to adapt this motor particularly to service in heavy cruisers and work boats. It would be utterly unsuitable for speed service.

Next in line comes the F-M model, the second initial signifying medium speed and identifying the motor as being adapted to cruiser work. This model resembles the F-S engine more nearly than it does the F-H, and it delivers its greatest efficiency at a speed ranging between 600 and 1,000 r.p.m. The Model F-S is intended solely for speed work in fast runabouts, express cruisers and the like. It is fitted with slightly higher compression and two-spark ignition, and develops its greatest usefulness at from 1,000 to 1,400 r.p.m. Either an iron or an aluminum base may be used with the M and S models, according to the amount of weight which the boat will carry.

Our sales force emphasizes to the prospective purchaser that the same motor will not do all classes of work, but that every power plant must be built and adjusted to the conditions under which it is to operate. In rating the F-S engine at 1,000 to 1,400 r.p.m. we do not mean that it cannot be run at lower speeds; but we insist that it shall not be equipped with a propeller that would load it up under the lower rating of revolutions. In building these different models, attention is particularly directed to the piston

(Continued on page 92)



A typical marine motor of 1917. Note its clean-cut appearance and many refinements. All moving parts are enclosed, and, taken altogether, it is a most finished piece of mechanism

American Marine Motors and their Manufacturers

An Alphabetical List of the Makes of Motors Included in the Following Tables, with the Names and Addresses of Their Manufacturers

NAME OF MOTOR	NAME OF MANUFACTURER	NAME OF MOTOR	NAME OF MANUFACTURER	NAME OF MOTOR	NAME OF MANUFACTURER
Able	Able Engine Co., Inc., New York City	Grasser	Grasser Motor Co., Toledo, O.	Ontario	A. E. Olmstead & Sons, Pulkaski, N. Y.
Aerothrust	Aerothrust Engine Co., La Porte, Ind.	Gray	Gray Motor Co., Detroit, Mich.	Oriole	Page Engineering Co., Baltimore, Md.
American	American Engine Co., Detroit, Mich.	Grizzly Bear	Parrott & Hahn, Olympia, Wash.	Palmer	Palmer Bros., Cos Cob, Conn.
Amphion	A. J. Machek & Co., Milwaukee, Wis.	Guarantees	Guarantees Motor Co., Hamilton, Ont.	Peerless	Peerless Marine Motor Co., Buffalo, N. Y.
Anderson	Anderson Engine Co., Chicago, Ill.	Hall	Hall Gas Engine Co., Inc., Bridesburg, Phila., Pa.	Philadelphia	Central Machine Co., Philadelphia, Pa.
Aristocrat	Carson Motor Co., Detroit, Mich.	Harris	Harris Engine Co., Wilmington, Del.	Pierce-Budd	Pierce-Budd Co., Bay City, Mich.
Aristox	Black Rock Mfg. Co., Bridgeport, Conn.	Harford	Gray & Prior Machine Co., Hartford, Conn.	Ralaco	S. M. Jones Co., Toledo, O.
Arrow	Arrow Motor & Machine Co., Inc., New York City	Hatch	Ingram Hatch Motor Corp., New York City	Red Wing	Red Wing Motor Co., Red Wing, Minn.
Atlas	Atlas Gas Engine Co., Oakland, Cal.	Hettinger	Hettinger Engine Co., Bridgeton, N. J.	Regal	Regal Gasoline Engine Co., Coldwater, Mich.
Automatic	Automatic Machine Co., Bridgeport, Conn.	Holliday	Kuehl Bros. Engine Works, Chicago, Ill.	Reliable	Reliable Engine Co., Portsmouth, O.
Barrie	Canada Producer & Gas Engine Co., Ltd., Barrie, Ont., Can.	Honest Injun	The Byers, Ltd., Toronto, Ont.	Remington	Remington Oil Engine Co., Stamford, Conn.
Brennan	Brennan Motor Mfg. Co., Syracuse, N. Y.	Hubbard	Hubbard Motor Co., Inc., Mid-dletown, Conn.	Roberts	Roberts Motor Mfg. Co., Sandusky, O.
Bridgeport	Bridgeport Motor Co., Bridgeport, Conn.	Imperial	Bruce Stewart Co., Ltd., Charlottetown, P. E. Island, Can.	Scripps	Scripps Motor Co., Detroit, Mich.
Buda	Buda Co., Harvey, Ill.	Ithaca	Champaign Bros., Ithaca, N. Y.	Sagamore	Sagamore Motor Works, W. Lynn, Mass.
Bud-E	Carlyle Johnson Machine Co., Manchester, Conn.	Johnson	Johnson Bros. Motor Co., Terre Haute, Ind.	Smalley	Smalley General Co., Bay City, Mich.
Buffalo	Buffalo Gasoline Motor Co., Buffalo, N. Y.	Joymotor	Joymotor Sales Co., Chicago, Ill.	Speedway	Gas Engine & Power Co. & Chas. L. Seabury & Co., Cons., Morris Heights, N. Y.
Caille	Caille Perfection Motor Co., Detroit, Mich.	Kahlenberg	Kahlenberg Bros. Co., Two Rivers, Wis.	Standard	Standard Motor Const. Co., Jersey City, N. J.
Capitol	Auto Engine Works, St. Paul, Minn.	Kemp "Airdrive"	Kemp Machine Works, Muncie, Ind.	Standard Oil	Standard Oil Engine Co., Bridgeport, Conn.
Carl	Carl Engine Works, Philadelphia, Pa.	Kermath	Kermath Mfg. Co., Detroit, Mich.	Stanley	Stanley Co., Salem, Mass.
Clay	Clay Engine Co., Cleveland, O.	Koban	Koban Mfg. Co., Milwaukee, Wis.	Sterling	Sterling Engine Co., Buffalo, N. Y.
Clifton	Clifton Motor Works, Cincinnati, O.	Lamb	Climax Engineering Co., Clinton, Ia.	Stork	Defoe Boat & Motor Works, Saginaw, Mich.
Craig	Jas. Craig Engine Works, Jersey City, N. J.	Lathrop	J. W. Lathrop Co., Inc., Mystic, Conn.	Strang	Strang Engine Co., Harvey, Ill.
Cunard	Russell A. Reed, New York City	Leary	Leary Gasoline Engine Co., Rochester, N. Y.	Sturtevant	B. F. Sturtevant Co., Boston, Mass.
Curtiss	Curtiss Aeroplane Motor Corp., Buffalo, N. Y.	Leighton	H. J. Leighton, Syracuse, N. Y.	Thomas	Thomas Aeromotor Co., Inc., Ithaca, N. Y.
Dice	Dice Machine Co., Anderson, Ind.	Lisk	Geo. A. Lisk, Detroit, Mich.	Toledo	Universal Mach. Co., Bowling Green, O.
Doman	H. C. Doman Co., Oshkosh, Wis.	L-A	Lockwood-Ash Motor Co., Jackson, Mich.	Twentieth Century	New York Yacht, Launch & Engine Co., Morris Height, N. Y.
Duesenberg	Loew-Victor Engine Co., Chicago, Ill.	Loew-Victor	Loew-Victor Engine Co., Chicago, Ill.	Union	Union Gas Engine Co., Oakland, Cal.
Dunn	Dunn Motor Works, Ogdensburg, N. Y.	Mathews	Matthews Engineering Co., Port Clinton, O.	Universal	Universal Motor Co., Oshkosh, Wis.
Eagle	Standard Co., Torrington, Conn.	Mianus	Mianus Motor Works, Stamford, Conn.	Valveless	Nichols & Wright Motor Co., Buffalo, N. Y.
Elco	Elco Co., Bayonne, N. J.	Miller	Miller Gas & Vacuum Engine Co., Chicago, Ill.	Van Blerck	Van Blerck Motor Co., Monroe, Mich.
Erd	Erd Motor Co., Saginaw, Mich.	Missouri	Missouri Engine Co., St. Louis, Mo.	Vim	Vim Motor Co., Sandusky, O.
Essex	Essex Engine Co., Lynn, Mass.	Mohawk	S. R. Mfg. Co., Schenectady, N. Y.	Vulcan	Vulcan Engine Works, Philadelphia, Pa.
Evanaville	Evansville Gas Engine Works, Evansville, Ind.	Monitor	Monitor Boat & Engine Co., Newark, N. J.	Waterman	Waterman Motor Co., Detroit, Mich.
Evinrude	Evinrude Motor Co., Milwaukee, Wis.	Morton	Morton Motor Co., Detroit, Mich.	Watertown	Gillespie Mfg. Co., Jersey City, N. J.
Fairbanks-Morse	Fairbanks, Morse & Co., Chicago, Ill.	Motorgo	Sears, Roebuck & Co., Chicago, Ill.	Watkins	Watkins Motor Co., Cincinnati, O.
Fay & Bowen	Fay & Bowen Engine Co., Geneva, N. Y.	Murray & Tregurtha	Murray & Tregurtha Co., So. Boston, Mass.	Westman	Enterprise Machine Co., Minneapolis, Minn.
Ferro	Ferro Machine & Foundry, Cleveland, O.	Niagara	Niagara Motors Corp., Dunkirk, N. Y.	Winton	Winton Engine Works, Cleveland, O.
Fisherman	Loane Trask Eng. Co., Baltimore, Md.	Nieland	J. E. Nieland & Co., San Francisco, Cal.	Wisconsin	Wisconsin Machinery & Mfg. Co., Milwaukee, Wis.
Foreman	Foreman Motor & Machine Co., Toronto, Can.	Nisco Diesel	New London Ship & Engine Co., Groton, Conn.	Wisconsin Consistent	Wisconsin Motor Mfg. Co., Milwaukee, Wis.
Frisbie	Frisbie Motor Co., Middletown, Conn.			Wolverine	Wolverine Motor Works, Bridgeport, Conn.
Frisco Standard	Standard Gas Engine Co., San Francisco, Cal.			Wood & Chute	Wood & Chute Machine Co., Greenport, N. Y.
Fulton	Fulton Mfg. Co., Erie, Pa.				

The Two-Cycle Motors Nineteen-Seventeen

[It is MoToR BOATING's purpose in offering these tables to its readers to provide a comprehensive index and directory for the ready reference of an engine purchaser. In other years the motors have been arranged according to cylinder number, rotative speed, and the like, but in this issue they are divided only into the cycle groups. With the present arrangement it is possible for the reader to tell at a glance exactly what the American market has to offer in any desired horsepower, whether it comes in one, two or more cylinders, and

he is thus enabled to compare the specification of rival makes of motors with the utmost ease.

The initials used under the valve location column are those commonly adopted for differentiating among motors having all the valves on one side, valves on opposite sides, valves in the head, or intakes in the head and exhausts on the side (L, T, I, and H, & S., respectively). A detailed explanation of the initials under the ignition column may be necessary, however. The material from which these tables are compiled comes, naturally, from the engine makers themselves, and under the ignition heading particularly the information is likely to differ in meaning. Thus, one manufacturer will write us that his products are fitted with jump spark ignition, while another will say merely that batteries are the current source, giving

no indication whether the current is employed in low or high tension service. In the main, however, the information is complete on this score.

The initials J. S. stand, therefore, for jump spark and the letters M. B. for make and break. When the letter O follows either of these combinations it signifies that magneto or battery equipment is optional with the purchaser; when M occurs it denotes that a magneto is regularly supplied, while B stands for battery equipment. D is an abbreviation for distributor, although in the smaller power sizes this may be generally taken to mean the ordinary timer and coil with dry cell ignition. The form J. S. & M. B. indicates that both types of ignition are regularly equipped, while J. S. or M. B. shows that either jump spark or make and break will be supplied at the option of the purchaser. The sign * is used when the weight of the engine alone is given; all other weights include the reverse gear.—Editor.]

Under 5 Horsepower

Rated H.P.	Motor	No. of Cyl.	Bore & Stroke	R.P.M.	Wt.	2 or 3 Port	Ignition	Rated H.P.	Motor	No. of Cyl.	Bore & Stroke	R.P.M.	Wt.	2 or 3 Port	Ignition
1 1/2	Eagle	1	3 x 3	600	95*	2	M. B. O.	5	Vim	1	4 x 4	750	175	3	J. S. M.
1 1/2	Hubbard	1	3 1/2 x 3 1/2	600	164	2	M. B.	5	Wisconsin	1	4 x 5	700	200	3	J. S. M.
1 1/2	Ithaca	1	3 x 3	650	50*	2	S. D.	5	Wood & Chute	1	3 x 5	500	390	2	J. S. & M. B. M.
2	American	1	3 x 3 1/2	700	140	2	S. D.	5	Bud-E	2	3 x 3	1,200	106	3	J. S. M.
2	Caillé	1	3 x 3 1/2	700	140	2	S. D.	5	Evinrude	2	2 1/2 x 2 1/2	1,600	—	3	J. S. D.
2	Dunn	1	3 1/2 x 4	500	100	2	S. D.	5	Ithaca	2	3 1/2 x 3 1/2	700	156*	3	J. S. D.
2	Ithacra	1	2 1/2 x 2 1/2	800	—	2	S. D.	5	Palmer	2	2 1/2 x 2 1/2	700	180	2	J. S. B.
2	Mians	1	3 1/2 x 3 1/2	650	100*	2	S. D.	5	Ferro	1	4 1/2 x 4 1/2	800	243	2	M. B. O.
2	Palmer	1	3 1/2 x 3 1/2	500	135	2	M. B. B.	5	Gray	1	4 1/2 x 4 1/2	1,100	240	3	J. S. O.
2 1/2	American	1	3 1/2 x 3 1/2	800	175	2	S. D.	5	Palmer	1	5 x 6	325	335	2	M. B. B.
2 1/2	Bridgeport	1	3 1/2 x 3 1/2	500	140*	2	M. B. M.	5	Eagle	1	4 1/2 x 5	800	240	2	J. S. O.
2 1/2	Caillé	1	3 1/2 x 3 1/2	800	175	2	I. S. O.	5	Essex	1	5 x 6	600	320	2	J. S. or M. B. O.
2 1/2	Hubbard	1	3 1/2 x 3 1/2	600	194	2	M. B.	5	Caillé	1	4 1/2 x 4 1/2	800	235	2	J. S. O.
2 1/2	L-A	1	3 1/2 x 3 1/2	100	—	2	S. B.	5	Eagle	1	4 1/2 x 5	900	220	3	J. S. O.
2 1/2	Motorgo	1	3 1/2 x 3 1/2	750	97*	2	S. B.	5	Fulton	1	4 1/2 x 5	600	371	2	Sif. Spkr.
2 1/2	Palmer	1	3 1/2 x 3 1/2	700	125	2	S. B.	5	Kahlenberg	1	5 x 5	400	400	2	M. B. M.
2 1/2	Valveless	1	3 x 3	720	69	3	S. D.	5	Lathrop	1	5 x 5	500	—	2	J. S. or M. B. O.
3	Hubbard	1	4 x 4 1/2	600	250	2	M. B.	5	Lathrop	1	5 1/2 x 6 1/2	400	333	2	J. S. O.
3	Ithaca	1	4 1/2 x 4 1/2	500	175*	3	I. S. D.	5	Mians	1	4 1/2 x 3 1/2	1,200	—	2	J. S. M.
3	Essex	1	3 1/2 x 3 1/2	500	—	2	M. B. M.	5	Mohawk	1	4 1/2 x 4 1/2	700	—	2	J. S. M.
3	Ferro	1	3 1/2 x 3 1/2	900	150	3	I. S. O.	5	Mohawk	1	4 1/2 x 4 1/2	700	—	2	J. S. M.
3	Gray	1	3 1/2 x 3 1/2	1,100	139	3	I. S. O.	5	Palmer	1	5 x 6	400	350	2	M. B. B.
3	Guarantee	1	3 1/2 x 3 1/2	700	150	2	Batt.	5	Palmer	1	5 x 6	625	325	3	J. S. B.
3	Honest Injun	1	3 x 3	800	60*	2 & 3	I. S. O.	5	Pierce-Budd	1	4 x 4	1,200	140	2 & 3	J. S. D.
3	Kahlenberg	1	3 1/2 x 3 1/2	600	125	2	M. B. B.	5	Red Wing	1	4 1/2 x 4 1/2	800	260	3	J. S. B.
3	Lathrop	1	4 x 4	550	204	2	I. S. or M. B. O.	5	Sagamore	1	4 1/2 x 5	500	260	2	M. B. B.
3	Mians	1	4 x 4	550	204	2	M. B.	5	Smalley	1	4 1/2 x 4 1/2	950	—	3	J. S. D.
3	Ontario	1	3 1/2 x 3 1/2	900	125	3	I. S. M.	5	Stork	1	4 1/2 x 4 1/2	700	225	3	J. S. B.
3	Red Wing	1	3 1/2 x 3 1/2	700	175	2	I. S. B.	5	Toledo	1	4 1/2 x 4 1/2	750	—	3	J. S. M.
3	Sagamore	1	4 x 4	600	140	2	M. B. B.	5	Vim	1	5 x 5	450	330	3	J. S. M.
3	Snapper	1	4 1/2 x 4	205	—	2	M. B. O.	5	Waterman	1	4 x 4	900	140	3	J. S. & M. B. M.
3	Stanley	1	4 x 4 1/2	500	250	2	M. B. B.	5	Wood & Chute	1	5 1/2 x 6	500	450	2	J. S. O.
3	Stork	1	3 1/2 x 3 1/2	700	120	3	I. S. D.	5	Ferro	1	3 1/2 x 3 1/2	900	183	3	J. S. O.
3	Toledo	1	3 1/2 x 3 1/2	750	—	3	I. S. B.	5	Gray	2	3 1/2 x 3 1/2	1,100	185	2	J. S. O.
3	Watkins	1	3 x 3	900	50	3	I. S. B.	5	Guarantee	2	3 1/2 x 3 1/2	600	275	2	Batt.
3	Wood & Chute	1	4 x 4	600	250	2	S. & M. B. M.	5	Honest Injun	2	3 x 3	900	100*	2 & 3	J. S. O.
3 1/2	Eagle	1	3 1/2 x 3 1/2	1,000	108	3	I. S. B.	5	I. S. B.	2	3 1/2 x 3 1/2	160	—	2	J. S. B.
3 1/2	Mohawk	1	3 1/2 x 3 1/2	900	—	2	I. S. B.	5	Mians	2	4 x 4	550	363	2	M. B.
3 1/2	Palmer	1	4 1/2 x 4 1/2	450	240	2	M. B. B.	5	Mohawk	2	3 1/2 x 3 1/2	750	154*	3	J. S. M.
3 1/2	Palmer	1	4 1/2 x 4 1/2	475	220	3	M. B. B.	5	Ontario	2	3 1/2 x 3 1/2	900	190	3	J. S. M.
3 1/2	Valveless	1	3 1/2 x 3 1/2	720	88	3	I. S. D.	5	Sagamore	2	4 x 4	600	250	2	M. B. B.
3 1/2	American	1	3 1/2 x 3 1/2	800	190	3	I. S. O.	5	Stanley	2	3 1/2 x 3 1/2	500	350	2	M. B. B.
3 1/2	Bridgeport	1	4 1/2 x 4 1/2	500	225*	3	M. B. M.	5	Vim	2	3 1/2 x 3 1/2	700	200	3	J. S. D.
4	Caillé	1	3 1/2 x 3 1/2	800	185	2	I. S. O.	5	Watkins	2	3 1/2 x 3 1/2	900	100	3	J. S. D.
4	Ferro	1	3 1/2 x 3 1/2	800	186	2	I. S. O.	5	Wood & Chute	2	4 x 4	600	400	2	J. S. M.
4	Fulton	1	3 1/2 x 3 1/2	650	218	3	Sif. Spkr.	5	Foreman	2	3 1/2 x 3 1/2	175	—	3	J. S. M.
4	Hubbard	1	4 1/2 x 5	575	305	2	M. B.	5	Dunn	3	3 1/2 x 4	600	250	2	J. S. D.
4	Imperial	1	4 x 4 1/2	190*	—	2	I. S.	5							
4	Kahlenberg	1	4 x 4	550	160	2	M. B. B.	5							
4	L-A	1	4 x 4	135	—	2	S. B.	5							
4	Lathrop	1	4 1/2 x 5	500	—	2	I. S. or M. B. O.	5							
4	Motorgo	1	4 x 4	750	135	2	S. B.	5							
4	Palmer	1	4 1/2 x 4 1/2	650	210	3	I. S. B.	5							
4	Red Wing	1	4 1/2 x 4 1/2	800	210	2	I. S. B.	5							
4	Roberts	1	3 1/2 x 4	1,000	95	3	I. S. O.	5							
4	Stork	1	4 x 4	700	180	3	I. S. D.	5							
4	Wood & Chute	1	4 1/2 x 5	550	340	2	I. S. & M. B. M.	5							
4	Dunn	1	3 1/2 x 4	600	215	2	I. S. D.	5							
4	L-A	2	2 1/2 x 2 1/2	—	55	3	I. S. M.	5							
4	Palmer	2	3 1/2 x 3 1/2	500	180	2	M. B. B.	5							
4 1/2	Essex	2	4 1/2 x 5 1/2	500	—	2	M. B. M.	5							

5 to 7 Horsepower

Rated H.P.	Motor	No. of Cyl.	Bore & Stroke	R.P.M.	Wt.	2 or 3 Port	Ignition	Rated H.P.	Motor	No. of Cyl.	Bore & Stroke	R.P.M.	Wt.	2 or 3 Port	Ignition
5	Bridgeport	1	5 1/2 x 5 1/2	500	260*	3	M. B. M.	7	Bridgeport	1	5 1/2 x 6	450	420*	3	M. B. M.
5	Eagle	1	4 1/2 x 4 1/2	800	210	2 or 3	J. S. or M. B. O.	7	Eagle	1	6 x 6	400	625	2	M. B. D.
5	Fay & Bowen	1	4 1/2 x 4 1/2	550	330	2	M. B.	7	Grasser	1	4 1/2 x 4 1/2	800	220*	2 & 3	I. S. O.
5	Fulton	1	3 1/2 x 4	700	218	3	I. S. D.	7	Guarantee	1	5 x 5	500	400	2	Batt.
5	Guarantee	1	3 1/2 x 4 1/2	600	275	2	Batt.	7	Honest Injun	1	5 x 5	700	175*	2 & 3	J. S. O.
5	Hartford	1	4 x 4	700	220	2	S. D.	7	Hubbard	1	5 x 6	450	557	2	M. B.
5	Hubbard	1	5 x 5 1/2	800	95*	2 & 3	I. S. O.	7	Kahlenberg	1	5 x 6</				

The Two-Cycle Motors of Nineteen-Seventeen

7 to 10 Horsepower (Continued)

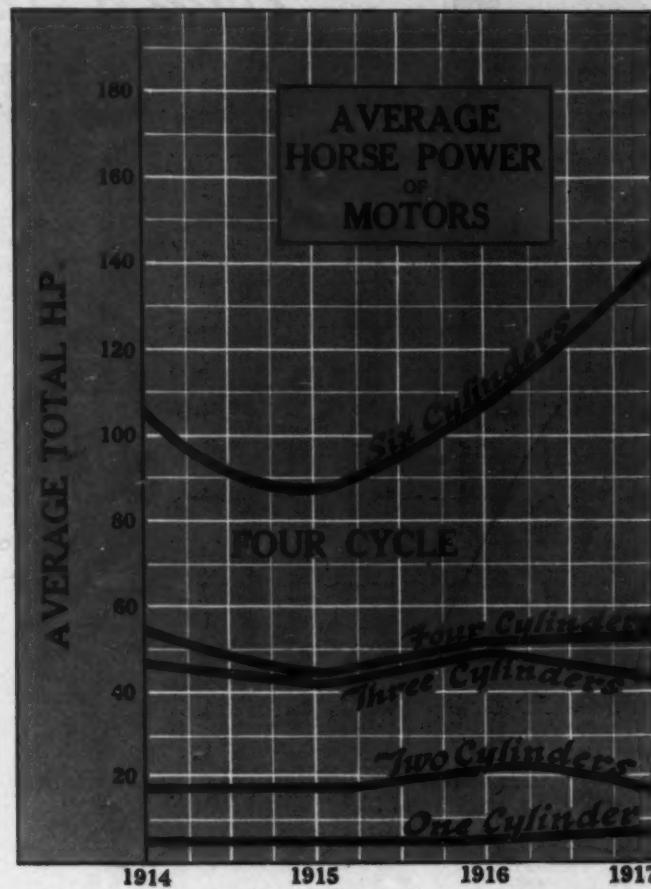
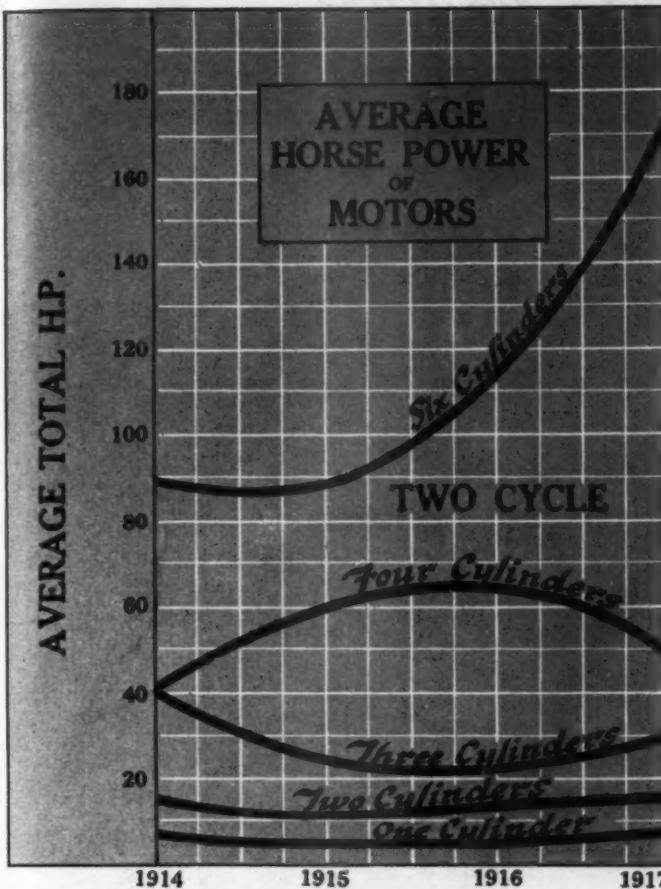
Rated H.P.	Motor	No. of Cyl.	Bore & Stroke	R.P.M.	Wt.	2 or 3 Port	Ignition	Rated H.P.	Motor	No. of Cyl.	Bore & Stroke	R.P.M.	Wt.	2 or 3 Port	Ignition
8	Kahlenberg	1	5 1/2 x 6	400	550	2	M. B. M.	16	Bridgeport	2	4 1/2 x 5	800	375*	2	M. B. M.
8	Lathrop	1	6 1/2 x 6 1/2	350	550	2	J. S. or M. B. O.	16	Fulton	2	4 1/2 x 5	700	440*	2	J. S. D.
8	Stork	1	5 x 5 1/2	700	370	3	J. S. D.	16	Kahlenberg	2	5 1/2 x 6	380	950	2	M. B. M.
8	American	2	5 1/2 x 5 1/2	900	550	2	J. S. O.	16	Lathrop	2	6 1/2 x 6 1/2	400	..	2	J. S. or M. B. O.
8	American	2	5 1/2 x 5 1/2	800	220	2	J. S. O.	16	Mohawk	2	4 1/2 x 5	900	..	2	J. S. D.
8	Bridgeport	2	5 1/2 x 5 1/2	500	375*	3	M. B. M.	16	Stork	2	5 x 5	700	555	2	J. S. D.
8	Caille	2	5 1/2 x 5 1/2	900	280	2	J. S. O.	16	Dunn	4	4 1/2 x 5	800	500	2	J. S. D.
8	Dunn	4	4 1/2 x 5	700	300	2	J. S. D.	16	Roberts	4	3 1/2 x 4	1,000	215	2	J. S. O.
8	Ferro	3	5 1/2 x 5 1/2	800	239	3	J. S. O.	16	Valveless	4	3 1/2 x 3 1/2	800	340	2	J. S. O.
8	Fulton	3	5 1/2 x 5 1/2	650	346	3	Sif. Spkr.	17	Oriole	2	6 1/2 x 6 1/2	425	1,170	2	J. S. or M. B.
8	Kahlenberg	4	x 4	550	350	2	M. B. M.	17	Ferro	3	4 1/2 x 4	800	448	2	J. S. O.
8	L-A	4	x 4	225	..	2	J. S. B.	17 1/2	Eagle	2	4 1/2 x 4	1,300	340	2	J. S. O.
8	Lathrop	4	5 1/2 x 5	550	..	2	J. S. or M. B. O.	18	Bridgeport	2	6 1/2 x 5	400	900*	2	M. B. M.
8	Motorgo	4	x 4	750	222*	..	J. S. B.	18	Foreman	4	4 1/2 x 4	500	500	2	J. S. M.
8	Palmer	4	5 1/2 x 5	450	325	3	M. B. B.	18	Fulton	2	5 1/2 x 5	450	700	2	Sif. Spkr. Batt.
8	Red Wing	4	5 1/2 x 5	800	350	3	J. S. B.	18	Guarantee	2	5 1/2 x 5	375	1,100	2	J. S. M.
8	Roberts	3	5 1/2 x 4	1,000	140	3	J. S. O.	18	Kahlenberg	6	x 6	700	450	2	M. B. M.
8	Stork	4	x 4	700	400	3	J. S. D.	18	Vim	5	x 5	800	800	2	J. S. M.
8	Valveless	3	5 1/2 x 5 1/2	800	208	3	J. S. O.	18	Kahlenberg	5	x 5	500	..	2	J. S. M.
8	Wood & Chute	4	5 1/2 x 5	550	560	2	J. S. & M. B. M.	18	Lathrop	2	5 1/2 x 5	700	600	2	J. S. D.
8	Palmer	3	5 1/2 x 5	600	230	3	J. S. B.	18	Mohawk	4	4 1/2 x 4	700	..	2	J. S. M.
8 1/2	Oriole	6 1/2 x 6 1/2	425	640	..	2	J. S. or M. B.	18	Stork	3	4 1/2 x 4	700	600	2	J. S. D.
9	Bridgeport	6 1/2 x 6 1/2	400	495*	3	M. B. M.	18	Toledo	3	4 1/2 x 4	750	..	2	J. S. B.	
9	Fulton	5	x 5	500	470	3	Sif. Spkr.	18	Vim	5	x 5	450	725	2	J. S. M.
9	Guarantee	5	x 5	500	500	..	Batt.	18	Caille	4	3 1/2 x 3 1/2	900	490	2	J. S. M.
9	Kahlenberg	6	x 6	375	650	2	M. B. M.	18	Caille	4	3 1/2 x 3 1/2	850	378	2	J. S. M.
9	Vim	5 x 5	700	285	3	J. S. M.	18	..	..	..	..	..	..	..
9	Hubbard	4	5 1/2 x 5	575	459	2	M. B.	18	..	..	..	..	..	..	..
9	Ontario	3	5 1/2 x 5 1/2	900	270	3	J. S. M.	18	..	..	..	..	..	..	..

10 to 15 Horsepower

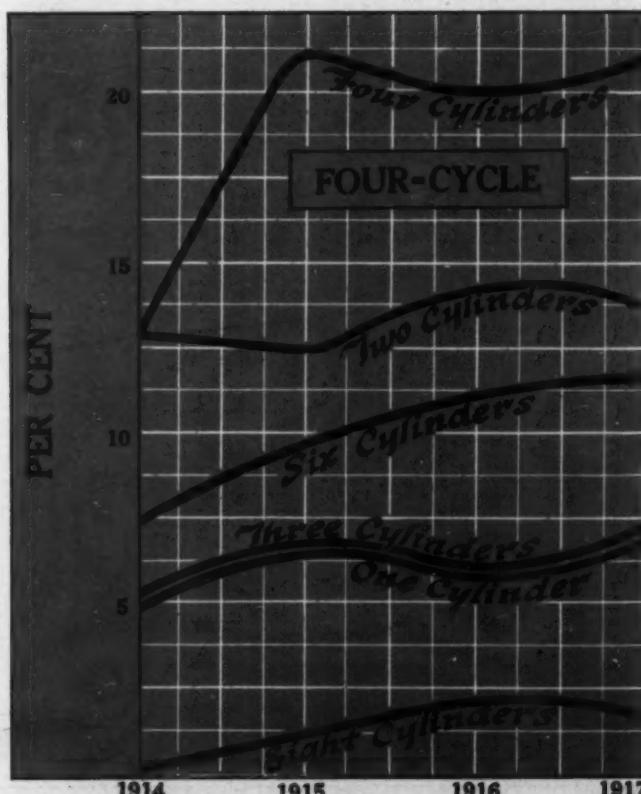
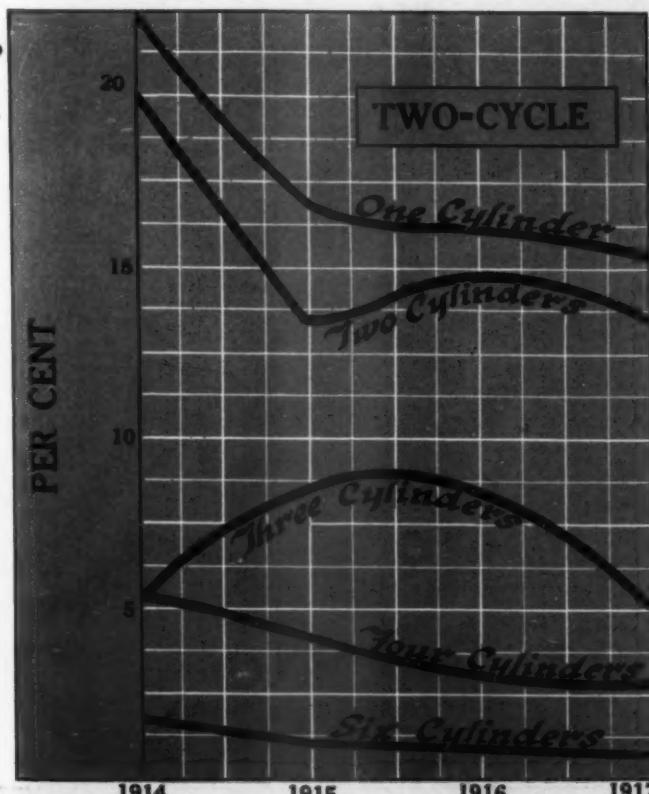
Rated H.P.	Motor	No. of Cyl.	Bore & Stroke	R.P.M.	Wt.	2 or 3 Port	Ignition	Rated H.P.	Motor	No. of Cyl.	Bore & Stroke	R.P.M.	Wt.	2 or 3 Port	Ignition
10	Fay & Bowen	1	6 1/2 x 6 1/2	475	810	2	M. B.	20	American	2	5 1/2 x 5	600	545	2	J. S. O.
10	Grasser	1	5 x 5	800	320*	2 & 3	J. S. D.	20	Caille	2	5 1/2 x 5	650	600	2	J. S. O.
10	Hartford	1	5 x 5 1/2	700	290	2	M. B. B.	20	Fay & Bowen	2	6 1/2 x 6 1/2	475	1,260	2	M. B. B.
10	Hubbard	1	7 x 7 1/2	375	873	2	M. B.	20	Hartford	2	5 x 5 1/2	700	440	2	J. S.
10	Imperial	1	5 1/2 x 6	520*	..	..	J. S.	20	Imperial	2	5 1/2 x 6	300	..	2	J. S. or M. B. O.
10	Lathrop	1	7 x 7 1/2	300	..	2	J. S. or M. B. O.	20	Mianus	2	6 1/2 x 7	375	1,347	2	M. B. B.
10	Mianus	1	6 1/2 x 7	375	813	2	M. B.	20	Wisconsin	3	4 x 4	850	365	3	J. S. M.
10	Bridgeport	2	5 1/2 x 5 1/2	500	470*	3	M. B. M.	20	Leary	4	3 1/2 x 4	1,000	417	3	J. S. D.
10	Fay & Bowen	2	4 1/2 x 4 1/2	550	510	2	M. B.	21	Watertown	4	3 1/2 x 4	1,000	380	3	J. S. O.
10	Fulton	2	3 1/2 x 4	700	351	3	J. S. D.	21	Kahlenberg	3	5 x 6	400	1,000	2	M. B. M.
10	Guarantee	2	4 1/2 x 4 1/2	600	450	..	Batt.	22	Mohawk	3	4 1/2 x 3 1/2	1,200	..	2	J. S. M.
10	Hartford	2	4 x 4 1/2	700	320	2	M. B. B.	23	Bridgeport	2	5 1/2 x 5	800	470*	2	M. B. M.
10	Honest Injun	2	4 x 4	750	175*	2 & 3	J. S. O.	24	Kahlenberg	2	6 1/2 x 7	350	1,300	2	M. B. M.
10	Imperial	2	4 1/2 x 4	..	370*	..	J. S.	24	Lathrop	2	7 1/2 x 7 1/2	275	..	2	J. S. or M. B. O.
10	Lathrop	2	5 1/2 x 5	500	..	2	J. S. or M. B. O.	24	Kahlenberg	3	5 1/2 x 6	380	1,200	2	M. B. M.
10	Leary	2	3 1/2 x 4	1,000	274	3	J. S. D.	24	Stork	3	5 x 5	700	700	3	J. S. D.
10	Mianus	2	4 1/2 x 5	500	605	2	M. B.	24	Lathrop	3	6 1/2 x 6 1/2	450	..	2	J. S. O.
10	Mohawk	2	4 1/2 x 4 1/2	500	..	2	J. S. M.	24	Dunn	6	4 1/2 x 5	800	650	2	J. S. D.
10	Oriole	2	4 1/2 x 5	475	625	2	J. S. or M. B.	25	Hubbard	2	7 x 7 1/2	375	1,600	2	M. B.
10	Palmer	2	4 1/2 x 4 1/2	650	325	3	J. S. B.	25	Vim	3	4 x 4	1,100	310	3	J. S. M.
10	Sagamore	2	4 1/2 x 5	500	450	2	M. B. B.	25	Pierce-Budd	3	5 x 5	800	555	2	J. S. O.
10	Stanley	2	4 1/2 x 4 1/2	450	575	2	M. B. M.	25	Mohawk	4	4 1/2 x 4	700	375	2	J. S. M.
10	Waterman	2	3 1/2 x 4	1,000	240	3	J. S. O.	25	Kahlenberg	3	6 x 6	1,500	..	2	M. B. M.
10	Wisconsin	2	4 x 4	750	265	3	J. S. M.	27	Vim	3	5 x 5	700	614	3	J. S. M.
10	Wood & Chute	2	5 x 5	550	600	2	J. S. & M. B. M.	27	Wisconsin	3	4 1/2 x 4	850	440	3	J. S. M.
10	Ithaca	3	4 1/2 x 4 1/2	550	425*	3	J. S. D.	28	Honest Injun	2	5 x 5	700	350*	2 & 3	J. S. O.
11	Bridgeport	1	5 1/2 x 5 1/2	800	260*	2	M. B. M.	28	Ontario	4	5 x 5	600	900	3	J. S. M.
11	Ferro	2	4 1/2 x 4 1/2	800	333	..	J. S. O.	..	..	..	..	..	..	..	..
11	Gray	2	4 1/2 x 4 1/2	1,100	325	3	J. S. O.	..	..	..	..	..	..	..	..
11	Hubbard	2	5 x 5	550	531	2	M. B.	..	..	..	..	..	..	..	..
12	Guarantee	1	7 x 7	450	500	..	Batt.	..	..	..	..	..	..	..	..
12	Kahlenberg	1	6 1/2 x 7	350	750	2	M. B. M.	..	..	..	..	..	..	..	..
12	Lathrop	1	7 1/2 x 7 1/2	275	..	2	J. S. or M. B. O.	..	..	..	..	..	..	..	..
12	Foreman	2	4 1/2 x 4 1/2	..	300	2	J. S. M.	..	..	..	..	..	..	..	..
12	Fulton	2	4 1/2 x 5	600	540	3	Sif. Spkr.	..	..	..	..	..	..	..	..
12	Kahlenberg	2	5 x 5	400	650	2	M. B. M.	..	..	..	..	..	..	..	..
12	Lathrop	2	5 1/2 x 5	500	..	2	J. S. or M. B. O.	..	..	..	..	..	..	..	..
12	Mianus	2	4 1/2 x 5	700	605	2	J. S. O.	..	..	..	..	..	..	..	..
12	Mohawk	2	4 1/2 x 4 1/2	700	..	2	J. S. M.	..	..	..	..	..	..	..	..
12	Palmer	2	5 x 6	625	425	3	J. S. B.	..	..	..	..	..	..	..	..
12	Red Wing	2	4 1/2 x 4 1/2	800	425	3	J. S. B.	..	..	..	..	..	..	..	..
12	Sagamore	2	4 1/2 x 5	500	475	2	M. B. B.	..	..	..	..	..	..	..	..
12	Stork	2	4 1/2 x 4 1/2	700	450										

The Answer of the Slide Rule

An Analysis of Four Years' Production in the Marine Motor Industry—
The Story of the Trend of Engine Design Told Graphically by Means of Curves



These two sets of curves show the distribution according to number of cylinders of the total number of models of marine motors on the market from 1914 to 1917. It is interesting to note how one set shows a decided decline in popularity while the other indicates just the reverse of this. The six- and eight-cylinder four-cycle motors which four years ago were built in only very small numbers are now well up toward the top



As will be observed from the above curves, the average horsepower of the various cylinder-groups has not changed materially during the four years, although the average power of the six-cylinder models has shown a marked increase in both the two- and the four-cycle types

The Four-Cycle Motors Nineteen-Seventeen

Under 6 Horsepower

Rated H.P.	Motor	No. of Cyl.	Bore & Stroke	R.P.M.	Wt.	Valve Location	Ignition
1 1/2	Nieland	1	3 1/2 x 3 1/2	800	95	L	M. B. B.
2	Nieland	1	3 1/2 x 4	700	115	L	M. B. B.
2	Regal	1	3 1/2 x 3 1/2	800	120	L	J. S. M.
2	Strang	1	3 1/2 x 4 1/2	1,000	360	L	J. S. M.
2 1/2	Anderson	1	4 x 4	600	250	T	J. S. D.
2 1/2	Holiday	1	3 1/2 x 5	600	300	L	J. S. O.
2 1/2	Mathews	1	3 1/2 x 3	1,200	235	L	J. S. M.
2 1/2	Automatic	1	4 x 4 1/2	475	350	L	J. S. or M. B. O.
3	Strang	1	4 1/2 x 5	500	300	L	J. S. M.
3	Palmer	1	4 1/2 x 4 1/2	600	350	L	J. S. O.
3 1/2	Evansville	1	4 1/2 x 5	500	290	L	J. S. D.
4	Anderson	1	4 1/2 x 5	550	375	T	J. S. O.
4	Clay	1	4 1/2 x 6	420	615	L	M. B. O.
4	Frisco Standard	1	4 1/2 x 6	450	400	L	J. S. D.
4	Grizzly Bear	1	4 1/2 x 5 1/2	600	350	L	M. B. O.
4	Guarantee	1	4 1/2 x 4 1/2	600	400	L	M. B. O.
4	Miller	1	4 1/2 x 5	600	400	L	J. S. O.
4	Missouri	1	4 1/2 x 5	225	—	L	J. S. O.
4	Nieland	1	5 x 6	350	350	L	M. B. M.
4	Regal	1	4 x 4 1/2	800	250	L	J. S. M.
4	Strang	1	4 x 4 1/2	900	480	L	J. S. M.
4	Union	1	3 1/2 x 6	400	530*	T	M. B. M.
4	Vulcan	1	4 1/2 x 6	500	360	L	J. S. D.
4	Buffalo	2	3 x 4	700	240	L	J. S. D.
4	Murray & Tregurtha	2	3 1/2 x 4	550	400	L	M. B. M.
4 1/2	Atlas	1	5 x 6	480	720	L	M. B. M.
4 1/2	Atlas	1	5 1/2 x 6 1/2	450	817	L	M. B. M.
4 1/2	Barrie	1	4 1/2 x 5	700	—	L	J. S. M.
4 1/2	Evansville	1	5 x 6	500	395	L	J. S. O.
4 1/2	Frisbie	1	4 1/2 x 5	600	325	L	J. S. or M. B. M.
4 1/2	Frisco S. Standard	1	5 1/2 x 6 1/2	400	850	L	M. B. O.
4 1/2	Holiday	1	5 x 6	500	300	L	J. S. D.
4 1/2	Lisk	1	4 1/2 x 5	400	175	L	J. S. D.
4 1/2	Matthews	1	3 1/2 x 3	1,200	275	L	J. S. M.
4 1/2	Palmer	1	5 x 6	600	400	L	J. S. M.
4 1/2	Peerless	1	5 x 7	600	350	L	J. S. D.
4 1/2	Regal	1	4 1/2 x 5 1/2	650	335	L	J. S. M.
4 1/2	Union	1	5 1/2 x 6 1/2	400	640*	T	M. B. M.
4 1/2	Vulcan	1	5 1/2 x 7	500	480	T	S. & M. B. M.
4 1/2	Wolverine	1	5 1/2 x 6	500	338	L	M. B. M.
5	Anderson	2	4 x 4	600	350	T	J. S. D.
5	Holiday	2	3 1/2 x 5	600	400	L	J. S. O.
5	Nieland	2	4 x 5	475	500	L	M. B. M.

6 to 10 Horsepower

Rated H.P.	Motor	No. of Cyl.	Bore & Stroke	R.P.M.	Wt.	Valve Location	Ignition
6	Anderson	1	5 x 6 1/2	500	600	T	J. S. D.
6	Atlas	1	6 x 7 1/2	400	—	L	M. B. M.
6	Automatic	1	5 1/2 x 7	400	643	L	J. S. or M. B. O.
6	Clay	1	5 1/2 x 7	400	675	L	J. S. O.
6	Fisherman	1	5 x 6	675	—	L	J. S. B.
6	Hall	1	5 1/2 x 6 1/2	500	625	L	J. S. or M. B. M.
6	Harris	1	5 1/2 x 6 1/2	550	—	L	M. B. D.
6	Hettinger	1	5 1/2 x 6 1/2	500	300	L	J. S. D.
6	Holiday-Victor	1	4 1/2 x 5 1/2	600	472	T	J. S. D.
6	Mianus	1	5 1/2 x 6	450	510	L	J. S. & M. B. O.
6	Miller	1	5 1/2 x 6	500	325	L	J. S. O.
6	Nieland	1	6 x 7 1/2	350	700	L	M. B. M.
6	Strang	1	4 1/2 x 6	850	525	L	J. S. or M. B. O.
6	Automatic	2	4 1/2 x 5	500	400	L	J. S. D.
6	Buffalo	2	3 1/2 x 5	600	400	T	J. S. D.
6	Domian	2	4 x 5	600	500	L	M. B. M.
6	Murray & Tregurtha	2	4 1/2 x 5	550	600	L	J. S. M.
7	Barrie	1	5 1/2 x 6	600	520	L	J. S. D.
7	Domian	1	5 1/2 x 6	500	500	L	J. S. or M. B. B.
7	Frisbie	1	6 x 6	500	1,130	L	M. B. O.
7	Frisco Standard	1	6 1/2 x 7	380	—	L	Batt.
7	Guarantee	1	5 1/2 x 6 1/2	500	450	L	J. S. or M. B. M.
7	Regal	1	5 1/2 x 6 1/2	550	780	L	J. S. M.
7	Palmer	2	4 1/2 x 4 1/2	600	500	L	J. S. M.
7	Union	2	4 1/2 x 5	600	500*	T	M. B.
7 1/2	Holiday	1	6 x 7	500	800	L	J. S. O.
7 1/2	Monitor	1	5 1/2 x 5	750	290	L	J. S. D.
7 1/2	Vulcan	1	6 1/2 x 7 1/2	450	750	T	J. S. M.
7 1/2	Evansville	2	4 1/2 x 5	500	390	L	J. S. O.
8	Nieland	1	6 1/2 x 8	325	800	L	M. B. M.
8	Clay	1	6 1/2 x 7	400	825	L	J. S. O.
8	Evansville	1	6 1/2 x 6 1/2	500	625	L	J. S. O.
8	Harris	1	6 x 7	475	—	L	M. B. M.
8	Palmer	1	6 1/2 x 8	400	1,200	L	M. B. O.
8	Philadelphia	1	6 x 8	375	800	L	M. B. O.
8	Strang	1	5 1/2 x 6	850	750	L	J. S. M.
8	Westman	1	5 1/2 x 5 1/2	600	400	L	J. S. M.
8	Wood & Chute	1	6 x 7	400	600	L	J. S. D.
8	Anderson	2	4 1/2 x 5	550	550	L	J. S. D.
8	Carl	2	4 1/2 x 5	650	525	L	J. S. D.
8	Clay	2	4 1/2 x 5	500	575	L	J. S. O.
8	Frisco Standard	2	4 1/2 x 6	440	1,000	L	M. B. M.
8	Grizzly Bear	2	4 1/2 x 5	450	750	L	J. S. D.
8	Guarantee	2	4 1/2 x 4 1/2	450	450	L	Batt.
8	Missouri	2	4 1/2 x 5	375	—	L	J. S. O.
8	Niagara	2	3 1/2 x 4 1/2	600	415	L	M. B. M.
8	Nieland	2	5 x 6	375	775	L	M. B. M.
8	Regal	2	4 x 4 1/2	800	450	L	J. S. M.
8	Union	2	5 1/2 x 6	500	1,500*	T	M. B.
8	Vulcan	2	4 1/2 x 6	550	650	T	J. S. & M. B. M.
9	Atlas	2	5 x 6	490	1,150	L	M. B. M.
9	Barrie	1	5 1/2 x 7	600	—	L	J. S. M.

6 to 10 Horsepower (Continued)

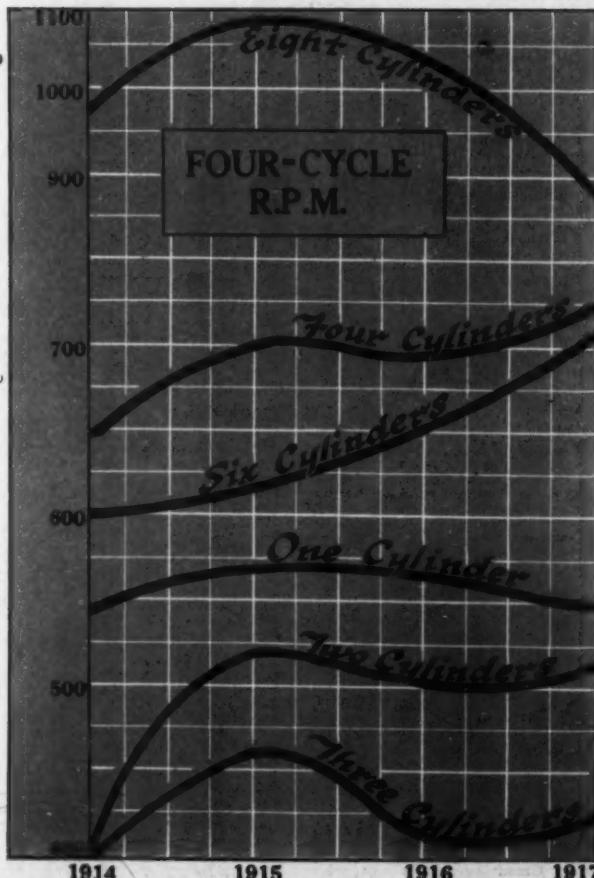
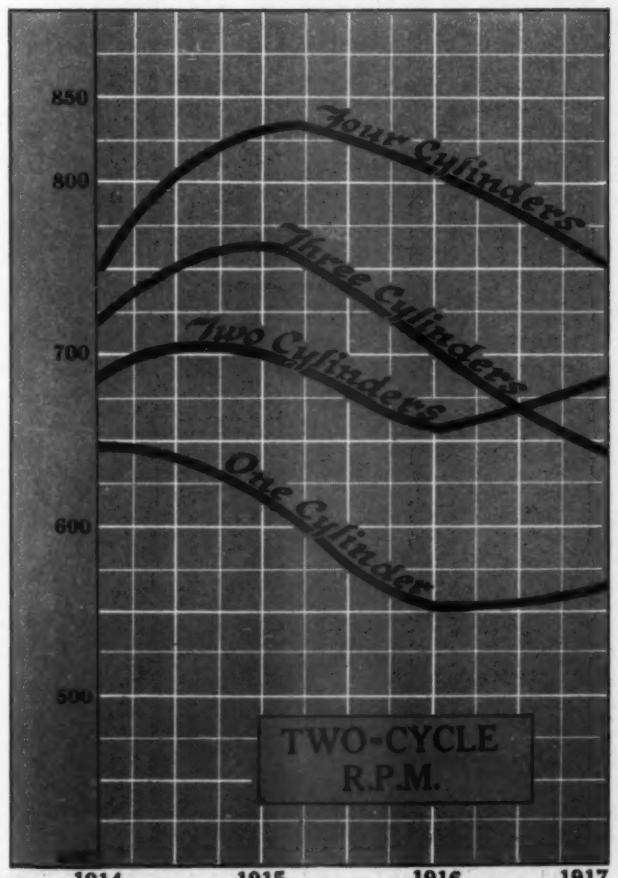
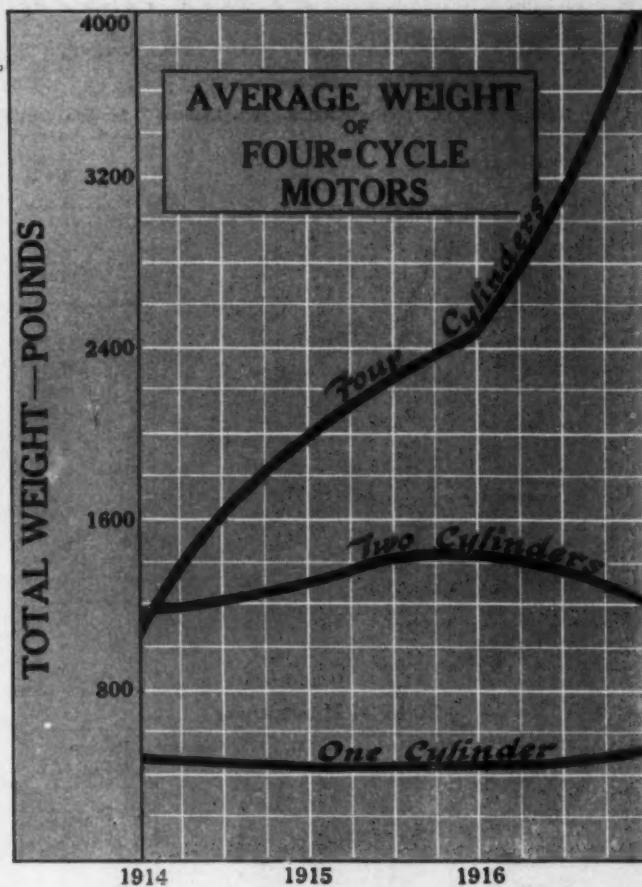
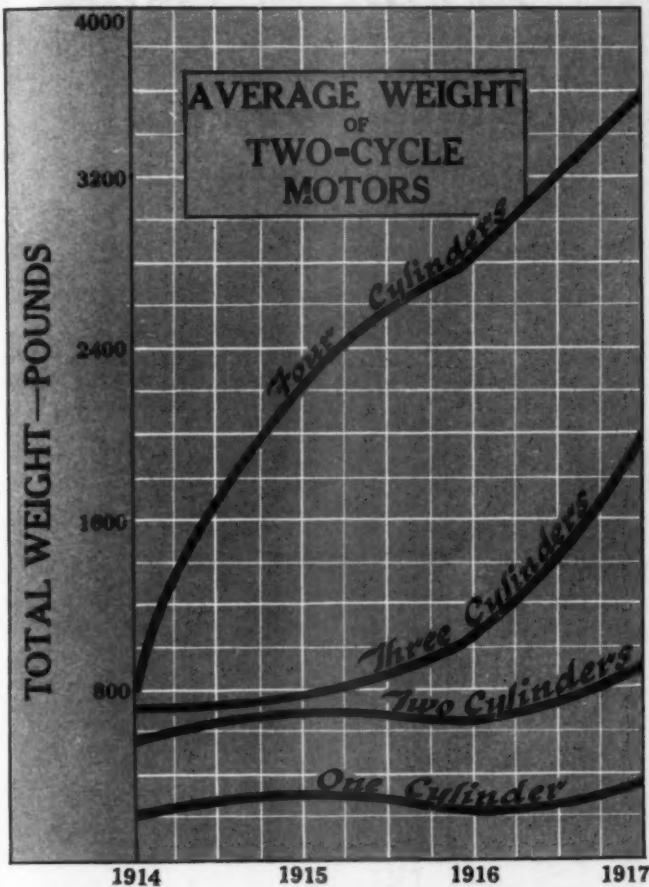
Rated H.P.	Motor	No. of Cyl.	Bore & Stroke	R.P.M.	Wt.	Valve Location	Ignition
9	Regal	1	6 1/2 x 7	500	1,040	L	J. S. or M. B. M.
9	Hettinger	1	6 1/2 x 6	640	—	L	J. S. D.
9	Automatic	3	4 1/2 x 5	500	760	L	J. S. or M. B. O.
9	Doman	3	4 x 5	600	680	T	J. S. D.

10 to 14 Horsepower

Rated H.P.	Motor	No. of Cyl.	Bore & Stroke	R.P.M.	Wt.	Valve Location	Ignition
10	Clay	1	7 1/2 x 7 1/2	400	950	I	J. S. O.
10	Guarantee	1	7 1/2 x 7	450	900	L	Batt.
10	Strang	2	4 1/2 x 5	700	—	L	J. S. M.
10	Barrie	2	5 x 6	750	—	L	J. S. M.
10	Dice	2	5 x 6	500	530	L	J. S. O.
10	Evansville	2	4 1/2 x 5	600	430	I	J. S. O.
10	Frisbie	2	4 1/2 x 5	400	1,320	I	J. S. or M. B. M.
10	Holiday	2	5 1/2 x 6	400	750	L	M. B. M.
10	Harris	2	5 x 6	500	750	L	J. S. O.
10	Kemp "Airdrive"	2	4 1/2 x 4	1,400	700	L	J. S. O.
10	Miller	2	4 1/2 x 6	600	1,180	L	M. B. M.
10	Nieland	2	6 x 7	325	600	L	J. S. M.
10	Peerless	2	4 x 6	800	450	L	J. S. D.
10	Peerless	2	5 x 7	600	500	L	J. S. M.
10	Ralaco	2	4 x 6	600	850	L	J. S. M.
10	Reliable	2	4 1/2 x 5 1/2	650	685	L	J. S. M.
10	Stork	2	5 x 5	550	850	T	M. B.
10	Stork	2	5 x 5	550	850	T	M. B.
10	Union	2	5 1/2 x 6 1/2	450	900	L	J. S. M.
10	Westman	2	4 1/2 x 5	600	250	L	J. S. M.
10	Doman	4	2 1/2 x 3 1/2	400	225	L	J. S. M.
10	Scripta	4	2 1/2 x 3 1/2	1,000	250	L	J. S. M.
10	Gray	2	3 1/2 x 4 1/2	1,100	385	L	J. S. M.
10	Harris	2	3 1/2 x 6 1/2	500	800	L	J. S. D.
10	Hettinger	2	3 1/2 x 6	500	825	L	J. S. O.
10	Lamb	2	3 1/2 x 6 1/2	475	—	L	J. S. O.
10	Lathrop	2	3 1/2 x 6 1/2	500	500	L	J. S. D.
10	Lisk	2	3 1/2 x 6 1/2	500	626	L	J. S. D.
10	Loew-Victor	2	3 1/2 x 6 1/2	600	626	L	

Heavier and Faster Motors the Rule

The Manufacturer of Marine Motors in Larger Units Raises the Weight Average—Higher Rotative Speed Made Possible by the Increase in Boat Speed



A glance backward over three years shows that the design of two-cycle motors has not kept pace with the four-cycle industry. Practically no net change has resulted in the speed of the two-cycle engines, while in the four-cycle type we find refinements and improvements in almost every particular.

•• The Four-Cycle Motors of Nineteen-Seventeen ••

14 to 16 Horsepower (Continued)

Rated H.P.	Motor	No. of Cyl.	Bore & Stroke	R.P.M.	Wt.	Location	Valve	Ignition
15	Evansville	4	4 1/2 x 5	500	630	I	J. S. O.	
15	Gray	4	3 x 4	2,000	440	L	J. S. M.	
15	Miller	4	3 1/2 x 5	650	550	L	J. S. M.	
15	Niagara	4	3 1/2 x 4 1/2	600	550	T	J. S. M.	

16 to 20 Horsepower

Rated H.P.	Motor	No. of Cyl.	Bore & Stroke	R.P.M.	Wt.	Location	Valve	Ignition
16	Atlas	2	6 1/2 x 7 1/2	425	2,475	L	M. B. M.	
16	Carl	2	6 x 7 1/2	450	700	I	J. S. O.	
16	Evansville	2	6 x 6 1/2	500	900	I	J. S. O.	
16	Frisbie	2	6 x 6	550	700	I	J. S. or M. B. M.	
16	Frisbie Standard	2	6 1/2 x 7 1/2	360	1,785	I	M. B. M.	
16	Hall	2	5 1/2 x 6 1/2	500	900	I	J. S. or M. B. M.	
16	Harris	2	6 x 7	450	1,060	T	M. B.	
16	Lathrop	2	5 1/2 x 8	400	..	T	J. S. O.	
16	Mianus	2	6 x 8	400	1,600	T	J. S. & M. B. O.	
16	Palmer	2	6 1/2 x 8	400	1,600	L	J. S. M.	
16	Philadelphia	2	6 x 8	375	1,800	L	M. B. O.	
16	Reliable	2	6 x 6	550	..	I	J. S. M.	
16	Stork	2	6 x 7	450	1,250	T	M. B.	
16	Union	2	6 1/2 x 8	400	1,750*	T	M. B.	
16	Westman	2	5 1/2 x 6 1/2	600	700	L	J. S. M.	
16	Wood & Chute	2	6 x 7	400	1,400	L	J. S. M.	
16	Frisbie	3	4 3/4 x 5	700	650	I	J. S. M.	
16	Kermath	4	3 1/4 x 4	1,200	450	L	J. S. O.	
16	Morton	4	3 1/2 x 4	1,000	450	I	J. S. M.	
16	Regal	4	4 x 4 1/2	800	650	L	J. S. M.	
16	Vulcan	4	4 1/2 x 6	550	900	T	J. S. & M. B. M.	
17	Reliable	2	5 1/2 x 6	600	..	I	J. S. M.	
17	Scripps	2	5 1/2 x 5	1,000	500	L	J. S. M.	
18	Barrie	2	5 1/2 x 7	600	..	L	J. S. M.	
18	Clay	2	6 1/2 x 7	400	1,525	I	J. S. O.	
18	Hettinger	2	6 1/2 x 8	425	1,600	L	J. S. or M. B. D.	
18	Murray & Tregurtha	2	6 1/2 x 8	425	1,600	L	M. B. M.	
18	Regal	2	6 1/2 x 7	500	1,560	I	J. S. or M. B. M.	
18	Scripps	2	5 1/2 x 6	700	900	I	J. S. M.	
18	Standard	2	6 x 8	400	1,200	H & S	M. B. M.	
18	Anderson	3	5 1/2 x 6	500	1,100	T	J. S. M.	
18	Automatic	3	5 1/2 x 7	400	1,425	L	J. S. or M. B. O.	
18	Doman	3	5 1/2 x 6	600	950	T	J. S. D.	
18	Lisk	3	4 3/4 x 5	500	600	L	J. S. D.	
18	Loew-Victor	3	4 1/2 x 5 1/2	600	716	T	J. S. M.	
18	Carl	4	4 1/2 x 6	750	610	L	J. S. O.	
18	Doman	4	4 x 5	700	800	T	J. S. M.	
18	Hettinger	4	4 1/2 x 6	..	1,100	L	J. S. D.	
18	Missouri	4	4 1/2 x 5 1/2	750	..	L	J. S. O.	
18	Wisc. Consistent	4	3 1/2 x 5	1,000	430	L	J. S. M.	

20 to 24 Horsepower

Rated H.P.	Motor	No. of Cyl.	Bore & Stroke	R.P.M.	Wt.	Location	Valve	Ignition
20	Atlas	2	7 1/2 x 9	350	3,078	L	M. B. M.	
20	Frisbie Standard	2	7 1/2 x 9	320	2,885	I	M. B. M.	
20	Guarantee	2	7 x 7	450	1,000	L	Batt.	
20	Nieland	2	7 1/2 x 9	275	2,000	L	M. B. M.	
20	Reliable	2	6 x 6	600	..	I	J. S. M.	
20	Stork	2	5 1/2 x 6 1/2	900	500	T	J. S. M.	
20	Strang	2	6 1/2 x 7	1,250	650	L	J. S. M.	
20	20th Century	2	6 1/2 x 8 1/2	400	1,800	L	J. S. M.	
20	Union	2	6 1/2 x 8 1/2	360	2,400*	L	M. B. M.	
20	Grizzly Bear	2	5 1/2 x 7	400	2,500	L	J. S. D.	
20	Nieland	3	5 1/2 x 7	300	1,900	T	M. B. M.	
20	Barrie	4	4 3/4 x 5 1/2	700	..	L	J. S. M.	
20	Buda	4	3 1/2 x 6 1/2	800	710	L	J. S. M.	
20	Buffalo	4	3 1/2 x 6 1/2	1,200	..	L	J. S. M.	
20	Evansville	4	3 1/2 x 6	500	900	I	J. S. M.	
20	Fay & Bowen	4	3 1/2 x 5	1,100	480	T	J. S. M.	
20	Holiday	4	3 1/2 x 5	500	1,500	T	J. S. O.	
20	Kermath	4	4 x 4	1,200	475	L	J. S. O.	
20	Motoro	4	3 1/2 x 4 1/2	750	550*	L	J. S. M.	
20	Palmer	4	4 1/2 x 6	600	1,250	L	J. S. M.	
20	Peerless	4	4 x 6	1,000	675	T	J. S. M.	
20	Ralston	4	4 x 6	600	1,375	T	J. S. M.	
20	Red Wing	4	3 1/2 x 5 1/2	1,200	520	L	J. S. M.	
20	Regal	4	4 1/2 x 6	650	900	L	J. S. M.	
20	Stork	4	3 1/2 x 6	550	1,600	L	J. S. M.	
20	Vulcan	4	3 1/2 x 7	500	1,200	T	J. S. or M. B. M.	
20	Westman	4	4 1/2 x 5 1/2	600	850	L	J. S. M.	
21	Barrie	5	5 1/2 x 7	600	600	L	J. S. M.	
21	Clifton	6	6 1/2 x 7	400	2,000	T	J. S. M.	
21	Lathrop	6	5 1/2 x 6 1/2	500	2,100	T	J. S. M.	
22	Buffalo	7	7 1/2 x 9	350	2,100	L	J. S. M.	
22	Clay	7	7 1/2 x 7 1/2	400	1,750	I	J. S. or M. B. M.	
22	Hall	6	6 x 9	425	1,600	L	M. B.	
22	Harris	6	6 1/2 x 8 1/2	375	1,650	T	M. B.	
22	Vulcan	6	6 1/2 x 8	425	2,200	T	J. S. & M. B. M.	
22	Wolverine	6	6 1/2 x 7	400	1,771	L	J. S. M.	
22	Miller	4	4 1/2 x 6	600	1,000	L	J. S. M.	
22	Wisc. Consistent	4	3 1/2 x 5	1,000	505	L	J. S. M.	

24 to 28 Horsepower

Rated H.P.	Motor	No. of Cyl.	Bore & Stroke	R.P.M.	Wt.	Location	Valve	Ignition
24	Bridgeport	2	7 1/2 x 9	375	2,000	L	J. S. M.	
24	Doman	2	7 x 9	400	1,850	T	J. S. M.	
24	Peerless	3	5 1/2 x 7	700	1,200	T	J. S. M.	
24	Evansville	6	6 x 6 1/2	500	1,260	T	J. S. O.	
24	Harris	6	6 x 7	500	1,110	T	J. S. O.	
24	Lathrop	3	5 1/2 x 8	400	..	T	J. S. O.	
24	Mianus	6	6 x 8	400	2,200	L	J. S. M.	
24	Palmer	6	6 1/2 x 8	400	2,000	L	J. S. M.	
24	Wood & Chute	3	6 x 7	400	1,650	L	J. S. M.	
24	Anderson	4	5 x 6	500	1,350	T	J. S. M.	
24	Automatic	4	5 1/2 x 6	400	1,800	L	J. S. or M. B. O.	
24	Buffalo	4	5 x 6 1/2	400	3,655	L	J. S. M.	
24	Capitol	4	3 1/2 x 5 1/2	1,000	525	L	J. S. M.	
24	Gray	4	3 1/2 x 4 1/2	1,500	440	L	J. S. M.	
24	Lamb	4	5 1/2 x 6	500	1,180	L	J. S. M.	
24	Missouri	4	5 x 6	950	..	L	M. B. M.	
24	Murray & Tregurtha	4	5 x 6	650	1,000	L	J. S. M.	
24	Red Wing	4	3 1/2 x 4 1/2	1,200	540	L	J. S. M.	
24	Standard	4	5 x 6 1/2	450	1,600	H & S	M. B. M.	
24	Wisc. Consistent	4	4 x 5	1,000	515	L	J. S. M.	
25	Anderson	2	7 x 8 1/2	450	1,200	T	J. S. M.	
25	Automatic	2	7 1/2 x 9	350	2,625	L	J. S. or M. B. O.	
25	Hettinger	2	7 1/2 x 9	..	2,500	L	J. S. D.	
25	Palmer	2	7 1/2 x 10	400	3,000	L	J. S. M.	
25	Ralco	2	7 x 9	400	3,300	L	M. B.	
25	Reliable	2	7 x 7	450	..	T	J. S. M.	
25	Stork	2	7 1/2 x 9	400	2,250	T	J. S. M.	
25	Frisbie	3	6 x 6	550	1,050	T	M. B. M.	
25	Frisbie Standard	3	6 1/2 x 7	450	2,310	I	M. B. M.	
25	Union	3	6 1/2 x 7	500	1,923*	T	M. B.	

24 to 28 Horsepower (Continued)

Rated H.P.	Motor	No. of Cyl.	Bore & Stroke	R.P.M.	Wt.	Location	Valve	Ignition
25	Vulcan	3	6 1/2 x 7 1/2	475				

The Four-Cycle Motors of Nineteen-Seventeen

42 to 60 Horsepower

Rated H.P.	Motor	No. of Cyl.	Bore & Stroke	R.P.M.	Wt.	Valve	Location	Ignition
42	Clay	2	8 1/2 x 10 1/2	375	3,000	I	J. S. O.	
42	Wolverine	3	8 1/2 x 9	350	3,130	L	J. S. or M. B. M.	
42	Scripps	6	4 1/2 x 5	675	1,200	T	J. S. M.	
42	Wisc. Consistent	6	4 1/2 x 5	1,000	700	T	J. S. M.	
44	Speedway	4	4 1/2 x 5 1/2	1,000	850	L	J. S. M.	
45	Harris	3	7 1/2 x 9	375	3,350	M. B.		
45	Union	3	8 1/2 x 10 1/2	330	6,450*	T	M. B. M.	
45	Buda	4	4 1/2 x 6	1,000		L	J. S. O.	
45	Buffalo	4	7 1/2 x 9	350	3,655	L	J. S. M.	
45	Doman	6	6 x 6	650	1,480	T	J. S. M.	
45	Doman	6	6 x 8	500	1,875	T	J. S. M.	
45	Fay & Bowen	5	5 x 6	1,000	800	T	J. S. M.	
45	Nagara	4	4 1/2 x 6 1/2	600	995	T	J. S. M.	
45	Sterling	6	6 1/2 x 6	400	2,850	H & S	J. S. M.	
45	Vulcan	4	7 1/2 x 8 1/2	425	3,400	T	J. S. & M. B. M.	
45	Wisc. Consistent	4	5 x 7	1,000	700	T	J. S. M.	
45	Automatic	6	5 1/2 x 6	550	2,500	L	J. S. O.	
45	Buda	6	5 1/2 x 6	1,100		L	J. S. O.	
45	Doman	6	6 1/2 x 6	650	1,500	T	J. S. M.	
45	Lamb	6	6 1/2 x 6	600	2,100	T	J. S. O.	
45	Ralaco	5	5 1/2 x 7	500	2,700	T	J. S. M.	
45	Speedway	6	4 1/2 x 6	600	1,740	L	J. S. M.	
48	Bridgeport	4	7 1/2 x 9	375	4,500	L	J. S. M.	
48	Doman	6	7 1/2 x 9	400	2,900	L	J. S. M.	
48	Speedway	6	6 x 6	600	1,700	L	J. S. M.	
50	Anderson	2	9 1/2 x 11	400	3,500	T	J. S. M.	
50	Reliable	2	9 1/2 x 11	350		L	J. S. M.	
50	Frisco Standard	3	8 1/2 x 10 1/2	300	6,480	T	M. B. M.	
50	Union	3	8 1/2 x 10 1/2	325	7,000*	T	M. B. M.	
50	Anderson	4	7 x 8 1/2	450	2,200	T	J. S. M.	
50	Atlas	4	7 1/2 x 9	350	4,430	L	J. S. or M. B. O.	
50	Automatic	4	7 1/2 x 9	500	3,000	L	J. S. O.	
50	Brennan	4	5 1/2 x 6	1,000	1,000	L	J. S. M.	
50	Capitol	4	5 1/2 x 6	1,000	675	T	J. S. M.	
50	Doman	4	5 1/2 x 6	1,000	850	T	Mag.	
50	Hall	6	6 x 9	425	2,400	L	J. S. or M. B. M.	
50	Holiday	4	7 x 9	425	3,500	L	J. S. O.	
50	Miller	6	6 x 9	400	2,500	L	J. S. M.	
50	Palmer	4	7 1/2 x 7	500	2,600	L	J. S. M.	
50	Peerless	4	5 1/2 x 7	400	4,200	L	J. S. M.	
50	Ralaco	7	7 x 9	700	1,600	T	J. S. M.	
50	Regal	4	7 1/2 x 9	425	4,800	I	M. B.	
50	Sterling	4	4 1/2 x 5 1/2	1,500	620	L	J. S. or M. B. M.	
50	Stork	4	5 1/2 x 6 1/2	800	850	T	J. S. M.	
50	Stork	7	7 1/2 x 9	400	4,300	L	J. S. M.	
50	20th Century	4	6 1/2 x 8 1/2	400	3,800	L	J. S. M.	
50	Union	4	7 1/2 x 8 1/2	450	4,625*	M. B.		
50	Westman	4	6 1/2 x 7	500	1,700	L	J. S. M.	
50	Brennan	6	4 1/2 x 5	1,000	850	L	J. S. M.	
50	Fay & Bowen	6	4 1/2 x 5 1/2	1,000	925	T	J. S. M.	
50	Ferro	6	4 x 6	1,000	1,235	L	J. S. M.	
50	Frisbie	6	4 1/2 x 5	800	985	L	J. S. M.	
50	Hall	5	5 1/2 x 6 1/2	500	2,400	L	J. S. or M. B. M.	
50	Lamb	3	5 1/2 x 5 1/2	900	775	T	J. S. M.	
50	Palmer	6	6 1/2 x 8	400	3,800	L	J. S. M.	
50	Sterling	6	5 1/2 x 6 1/2	400	3,700	L	J. S. M.	
50	Stork	6	4 1/2 x 5 1/2	800	1,100	T	J. S. M.	
50	Union	6	6 1/2 x 7	500	3,460*	M. B.		
54	Standard	6	6 x 8	400	3,200	H & S	M. B. M.	
55	Atlas	3	9 x 10 1/2	350	6,250	T	M. B. M.	
55	Gray	4	5 1/2 x 7	1,000	900	T	J. S. M.	
55	Van Blerck	4	5 1/2 x 6	1,000	1,186	T	J. S. M.	
56	Doman	3	7 x 9	400	2,500	T	J. S. M.	
56	Vulcan	3	8 1/2 x 10 1/2	400	4,200	T	J. S. & M. B. M.	
57	Barrie	6	6 x 7	600	...	L	J. S. M.	

60 to 100 Horsepower

Rated H.P.	Motor	No. of Cyl.	Bore & Stroke	Valve	R.P.M.	Wt.	Location	Ignition
60	Union	3	9 x 11	320	7,400*	T	M. B.	
60	Wolverine	3	9 1/2 x 12	300	5,556	L	J. S. or M. B. M.	
60	Brennan	4	6 x 6	1,000	1,200	L	J. S. M.	
60	Buffalo	4	5 1/2 x 7	900	1,730	L	J. S. M.	
60	Murray & Tregurtha	4	7 1/2 x 10	375	4,000	L	M. B. M.	
60	Nagara	4	5 1/2 x 7	600	1,525	T	J. S. M.	
60	Speedway	4	6 1/2 x 8	400	2,250	L	J. S. M.	
60	Automatic	5	5 1/2 x 7	550	2,750	L	J. S. O.	
60	Clifton	6	6 1/2 x 7	600	3,500	L	J. S. M.	
60	Doman	6	6 x 6	650	1,850	T	J. S. M.	
60	Doman	6	6 x 8	500	2,300	T	J. S. M.	
60	Lamb	6	6 1/2 x 7	500	2,900	L	J. S. M.	
60	Liak	6	6 x 7	500	2,000	T	J. S. M.	
60	Missouri	6	6 x 8	3,000		L	J. S. M.	
60	Scripps	6	4 1/2 x 5	1,300	950	L	J. S. M.	
60	Speedway	6	4 1/2 x 5 1/2	1,000	1,200	L	J. S. M.	
60	Wisc. Consistent	6	4 1/2 x 5 1/2	1,000	1,125	T	J. S. M.	
62	Wisc. Consistent	4	5 1/2 x 7	900	1,050	T	J. S. M.	
65	Clifton	3	8 1/2 x 11	400	4,500	L	J. S. M.	
65	Atlas	4	8 x 10	1,000	1,150	T	M. B. M.	
65	Fay & Bowen	5	5 x 6 1/2	1,000	1,150	T	J. S. M.	
66	Barrie	6	6 x 8	600		L	J. S. M.	
70	Automatic	4	7 1/2 x 9	500	4,800	L	J. S. O.	
70	Harris	4	8 x 10	350	5,500	T	M. B.	
70	Buffalo	6	7 x 9	350	4,850	L	J. S. M.	
70	Sterling	6	6 1/2 x 9	400	3,600	H & S	J. S. M.	
70	Vulcan	6	7 1/2 x 8 1/2	425	4,500	T	J. S. & M. B. M.	
70	Wisc. Consistent	6	5 1 x 11	1,000	1,150	T	J. S. M.	
72	Wisc. Consistent	4	5 1/2 x 7	900	1,100	T	J. S. M.	
72	Doman	7	7 x 9	400	3,100	T	J. S. M.	
75	Anderson	3	9 1/2 x 11	400	4,500	T	J. S. M.	
75	Automatic	3	10 x 14	275	8,000	L	J. S. or M. B. O.	
75	Elco	4	5 1/2 x 6	1,300	1,090	L	J. S. M.	
75	Miller	4	7 x 10	400	3,500	H & S	M. B. M.	
75	Standard	4	8 x 10	400	5,300	H & S	M. B. M.	
75	Sterling	4	5 1/2 x 6 1/2	1,000	1,600	T	J. S. M.	
75	Sturtevant	4	4 1/2 x 6	1,500	650	T	J. S. M.	
75	Union	4	8 1/2 x 10 1/2	360	9,100*	T	M. B.	
75	Van Blerck	4	6 x 6	1,000	1,235	T	J. S. M.	
75	Vulcan	4	8 1/2 x 10 1/2	375	5,500	T	J. S. & M. B. M.	
75	Westman	4	8 1/2 x 10	400	6,000	L	J. S. M. or M. B. O.	
75	Automatic	6	7 1/2 x 9	350	6,500	L	J. S. M.	
75	Doman	6	6 1/2 x 8	500	4,250	L	J. S. M.	
75	Frisbie	6	6 x 6	1,000	1,000	T	J. S. M.	
75	Ralaco	6	7 x 9	435	6,600	T	J. S. & M. B. M.	
75	Stork	6	7 1/2 x 9	400	6,000	T	J. S. M.	
75	Stork	6	5 1/2 x 6 1/2	1,000	1,200	T	J. S. M.	
75	20th Century	6	6 1/2 x 8 1/2	400	4,500	L	J. S. M.	
75	Union	6	7 1/2 x 8 1/2	450	5,850*	T	M. B.	
75	Westman	6	6 1/2 x 7	500	2,250	L	J. S. M.	
80	Frisco Standard	3	9 1/2 x 12	280	9,105	T	M. R. M.	

60 to 100 Horsepower (Continued)

Rated H.P.	Motor	No. of Cyl.	Bore & Stroke	Valve	R.P.M.	Wt.	Location	Ignition
80	Wolverine	3	11 x 12	300	5,976	L	J. S. or M. B. M.	
80	Atlas	4	9 x 10 1/2	800	2,600	L	M. B. M.	
80	Buffalo	4	6 1/2 x 9	350	5,000	L	J. S. M.	
80	Murray & Tregurtha	4	6 1/2 x 9	600	1,650	T	J. S. M.	
80	Nagara	6	5 1/2 x 6 1/2	1,000	1,025	T	J. S. M.	
80	Hall	6	7 x 9	400	3,200	L	J. S. or M. B. M	

*The
Diesel and Heavy Duty
Oil Motors of
Nineteen ~ Seventeen*

Two-Cycle

Rated H.P.	Motor	No. of Cyl.	Bore & Stroke	R.P.M.	Wt.	2 or 3 Port	Ignition
4	Hatch	1	3 1/2 x 3 1/2	1,200	132	..	Semi-Diesel
4	Remington	1	3 1/2 x 4	700	550	3	Hot Plug
6	Hatch	1	4 1/2 x 4	900	258	..	Semi-Diesel
7	Missouri	1	5 x 6	675	..	..	Semi-Diesel
7	Remington	1	5 1/2 x 6	500	800	3	Hot Plug
9	Hatch	1	5 1/2 x 6	700	475	..	Semi-Diesel
10	Remington	1	6 1/2 x 6	500	825	3	Hot Plug
10	Remington	1	6 1/2 x 6	500	855	3	Hot Plug
11	Remington	1	7 1/2 x 8	400	1,500	3	Hot Plug
12	Hatch	1	4 1/2 x 4	900	375	..	Semi-Diesel
13	Hatch	1	6 1/2 x 6	700	607	..	Semi-Diesel
14	Missouri	1	5 x 6	..	1,100	..	..
14	Remington	1	5 1/2 x 6	500	1,050	3	Hot Plug
15	Fairbanks-Morse	8	5 1/2 x 10	400	3,250	..	Semi-Diesel
16	Hatch	1	6 1/2 x 8	600	732	..	Semi-Diesel
17	Remington	1	8 1/2 x 8	400	1,650	3	Hot Plug
17	Remington	1	8 1/2 x 8	400	1,600	3	Hot Plug
18	Hatch	1	5 1/2 x 6	700	735	..	Semi-Diesel
18	Hatch	1	4 1/2 x 4	900	495	..	Semi-Diesel
22	Remington	1	6 1/2 x 6	500	1,100	3	Hot Plug
22	Missouri	1	5 x 6	..	1,650	..	..
23	Remington	1	5 1/2 x 6	500	1,600	3	Hot Plug
24	Remington	1	7 1/2 x 8	400	2,100	3	Hot Plug
24	Hatch	1	4 1/2 x 4	900	615	..	Semi-Diesel
26	Hatch	1	6 1/2 x 6	700	967	..	Semi-Diesel
27	Hatch	1	5 1/2 x 6	700	995	..	Semi-Diesel
30	Fairbanks-Morse	8	5 1/2 x 10	400	5,055	..	Semi-Diesel
30	Missouri	1	5 x 6	2,700	..	..	..
32	Hatch	1	6 1/2 x 8	600	1,192	..	..
32	Remington	1	5 1/2 x 6	500	1,750	3	Hot Plug
34	Remington	1	6 1/2 x 6	500	1,850	3	Hot Plug
35	Remington	1	8 1/2 x 8	400	2,300	3	Hot Plug
36	Hatch	1	10 1/2 x 10	450	1,800	..	Semi-Diesel
36	Hatch	1	5 1/2 x 6	700	1,255	..	Semi-Diesel
39	Hatch	1	6 1/2 x 6	700	1,327	..	Semi-Diesel
45	Fairbanks-Morse	8	5 1/2 x 10	400	6,864	..	Semi-Diesel
46	Remington	1	6 1/2 x 6	500	2,000	3	Hot Plug
48	Hatch	1	6 1/2 x 6	600	1,652	..	Semi-Diesel
50	Fairbanks-Morse	2	10 1/2 x 12 1/2	340	11,000	..	Semi-Diesel
52	Hatch	1	6 1/2 x 6	700	1,687	..	Semi-Diesel
55	Kahlenberg	..	..	300	4,000	..	M. B. & Hot Bulb
55	Remington	1	8 1/2 x 8	400	4,000	3	Hot Plug
60	Wisc. Consistent	2	5 x 14	400	4,500	..	Diesel
60	Fairbanks-Morse	4	8 1/2 x 10	400	8,000	..	Semi-Diesel
64	Hatch	1	6 1/2 x 8	600	2,112	..	Semi-Diesel
75	Fairbanks-Morse	3	10 1/2 x 12 1/2	340	13,700	..	Semi-Diesel
75	Remington	1	8 1/2 x 8	400	4,900	3	Hot Plug
76	Hatch	1	10 1/2 x 10	450	2,974	..	Semi-Diesel
80	Kahlenberg	..	..	..	7,500	..	Hot Bulb
85	Kahlenberg	..	..	300	5,500	..	M. B. & Hot Bulb
100	Remington	1	15 x 15	250	20,000	3	Hot Plug
100	Fairbanks-Morse	4	10 1/2 x 12 1/2	340	16,000	..	Semi-Diesel

Rated H.P.	Motor	No. of Cyl.	Bore & Stroke	R.P.M.	Wt.	2 or 3 Port	Ignition
115	Hatch	3	10 1/2 x 10	450	4,148	..	Semi-Diesel
120	Wisc. Consistent	2	8 x 22	350	8,500	..	Hot Bulb
120	Kahlenberg	3	..	..	10,000	3	Hot Plug
150	Remington	3	15 x 15	250	30,000	..	Hot Plug
150	Hatch	4	10 1/2 x 10	450	5,322	..	Semi-Diesel
160	Kahlenberg	4	..	..	15,000	..	Hot Bulb
200	Wisc. Consistent	3	8 x 22	350	13,000	3	Hot Plug
200	Remington	4	15 x 15	250	40,000	..	Hot Plug
280	Wisc. Consistent	4	8 x 22	350	17,000	..	Hot Diesel
300	Remington	6	15 x 15	250	60,000	3	Hot Plug

Four-Cycle

Rated H.P.	Motor	No. of Cyl.	Bore & Stroke	R.P.M.	Wt.	Valve Location	Ignition
8	Standard Oil	1	6 x 7 1/2	475	600	L	Hot Bulb
16	Standard Oil	2	6 x 7 1/2	475	705	L	Hot Bulb
24	Standard Oil	3	6 x 7 1/2	475	1,400	L	Hot Bulb
25	Standard Oil	3	7 1/2 x 9	400	1,100	L	Hot Bulb
32	Standard Oil	4	6 x 7 1/2	475	1,700	L	Hot Bulb
38	Standard Oil	3	7 1/2 x 12	375	4,300	L	Hot Bulb
40	Standard Oil	3	9 x 12	330	4,900	L	Hot Bulb
50	Fulton	8	8 x 9	400	9,000	L	Diesel
50	Standard Oil	4	7 1/2 x 10	375	5,400	L	Hot Bulb
60	Standard Oil	5	9 x 12	330	6,200	L	Hot Bulb
70	Fulton	4	8 x 9	400	13,000	L	Diesel
75	Standard Oil	3	10 x 14	375	14,000	L	Hot Bulb
80	Standard Oil	4	9 x 12	330	7,500	L	Hot Bulb
100	Standard Oil	4	10 x 14	275	17,000	L	Hot Bulb
100	Fulton	6	8 x 9	400	8,800	L	Hot Bulb
120	Niseco	4	9 x 12 1/2	350	16,500	I	Diesel
150	Craig	6	9 1/2 x 12	315	16,500	I	Diesel
180	Niseco	6	12 1/2 x 15	375	21,500	I	Diesel
200	Craig	6	9 1/2 x 12	420	16,500	I	Diesel
200	Craig	6	9 1/2 x 15	320	21,500	I	Diesel
240	Niseco	4	13 x 18	240	15,000	I	Diesel
240	Niseco	8	9 x 22 1/2	350	34,000	I	Diesel
250	Craig	6	12 1/2 x 15	240	28,000	I	Diesel
300	Craig	6	12 1/2 x 18	240	34,000	I	Diesel
350	Craig	8	12 1/2 x 15	250	37,000	I	Diesel
360	Craig	6	12 1/2 x 15	375	28,000	I	Diesel
360	Niseco	6	13 x 18	240	35,000*	I	Diesel
400	Craig	8	12 1/2 x 18	240	45,000	I	Diesel
480	Niseco	8	13 x 18	240	65,000*	I	Diesel
500	Craig	6	17 x 24	163	88,000	I	Diesel
500	Craig	6	12 1/2 x 15	380	88,000	I	Diesel
600	Craig	6	17 x 24	195	88,000	I	Diesel
600	Niseco	6	18 x 27	170	140,000*	I	Diesel
800	Niseco	4	18 x 27	170	200,000*	I	Diesel
800	Niseco	8	18 x 27	170	185,000*	I	Diesel
1,200	Niseco	6	18 x 27	170	300,000*	I	Diesel
1,600	Niseco	8	18 x 27	170	400,000*	I	Diesel

PER CENT



The four-cycle motor continues onward and upward in popularity. The old reliable two-cycle was leading by 10 per cent. three years ago, but now it is 26 per cent. in the rear and is still falling farther behind.

Co-operation Between Buyer and Builder

**A Necessary Condition Which Must Be Developed Before Perfection Will be Reached—
The Advisability of Such a State Seen in the Stock Boat Industry**

By John J. Amory

President, Gas Engine & Power Co. and Charles L. Seabury & Co., Cons.

TO what extent the motor boat is responsible for degenerating the mental and moral status of boating enthusiasts seems not only a pertinent, but a timely inquiry.

Exasperating delays in promised deliveries always try men's souls, and tend to make the most good-natured out of temper, while inducing them to commit some desecration of the king's English. The past season has seen an unusual prevalence of this condition and suggests an inquiry as to the reason and possible remedy.

Primarily granted that the builders are at fault in unfulfilled promises, yet almost universally some reasonable excuse is offered in the way of strikes in their own yards, or in the concerns of materials makers, in railroad embargoes on materials in transit and in the other vexations problems that are seemingly without end.

The question is, in what manner may the buyer and the builder aid each other in avoiding this distressing condition? Admittedly, it is the desire of the buyer to have the use of his boat within a reasonable time after contract, and necessarily the contract should be entered into at such a time as to permit the use of the boat in the boating season, May to October, and not from August to December.

Naturally, the builder accepts the order with a view to profit, and unquestionably the more smoothly and rapidly the work on the contract is progressed, and the more expeditious the delivery, the greater the prospect of the builder for an adequate return on his labor.

Of course, if the builder could make and sell a standard line of stock boats, as for example, following the custom of the automobile industry (one common, indeed, in every

other line of manufacture), the problem would be to a great extent solved. Stock manufacture enables the builder to provide in advance the necessary drawings, lumber, patterns, castings and all the hundreds of different elements that go toward making up a completed boat; and saves expense to the builder by duplications, thereby proving a large element in reducing the price to the buyer.

It is a curious fact that while the public will buy made-up articles of every nature under the sun, it balks at stock boats. The length may be satisfactory, but the beam or draft or speed or finish will not suit, while the same is true with alternates all along the line. Experience and judgment of people long engaged in the work count for little against the wish of the purchaser. His money pays—why is he not entitled to have exactly what he wants? This all builders concede, and so new drawings are made, and new molds taken out, with little that has been used before in the way of patterns of any use. Even the labor costs are increased.

It would appear that the logical plan of the builders would be to follow each a line of stock boats of specific sizes and styles and speed and build those only. People could then buy better boats at less cost than under present conditions.

It is not reasonable to suppose that stock styles would be applicable to cabin boats of any considerable size, for in them, like the building of a house, individual taste and personal requirements must of necessity be considered. In these the buyer can help the builder not only to better results, but better profits by allowing ample time for construction. From the lack of forethought evidenced

in placing orders, it is quite apparent that the average buyer has small conception of the time necessary. Before starting the work the careful builder must lay down the lines, make out his table of offsets and work out in the drafting room all the details of hull joiner work, fittings, etc., etc. This apparently simple matter is not done in a few hours, or even a few days, but takes weeks if the boat is of any considerable size. As a matter of information it is the writer's judgment that three months is the least possible time for properly building, from a new design, any cabin boat of the smaller sizes, say for example, 30 feet in length. For each added 10 feet, two weeks' additional time should be allowed up to and including 70 feet. The time required for the construction of boats from 70 to 100 feet in length, if of the cruising type, averages from five to six months. Generally speaking, if materials are available without any considerable delay, eight months to a year will suffice to turn out yachts of the largest size.

As a matter of course, the buyer wants to get the best he can for his money, and is willing supposedly that his builder is entitled to a fair return for his labor. On this theory each will benefit by stock boats in smaller sizes, and for larger or special designs by an ample allowance of time. Few, if any, of the builders have facilities for putting up more than a dozen cabin boats at one time under cover, and so unavoidable limitations exist which the buyer should consider.

Some of the manufacturers have had for a slogan the words, "Order now"; this is well, only "now" should be the day or week that the buyer decides to own a boat, and not the day and hour that he wishes to use one.

Falcon, A Raised-Deck Runabout

FALCON is a 30-foot raised-deck runabout owned by George L. Leonhard, of the Patterson Parchment Paper Co. of Passaic, N. J., and used during the summer months on

Lake Hopatcong. She was built as a regular model by the Fay & Bowen Engine Co. of Geneva, N. Y., and is powered with one of that concern's six-cylinder engines.

The design of the boat shows

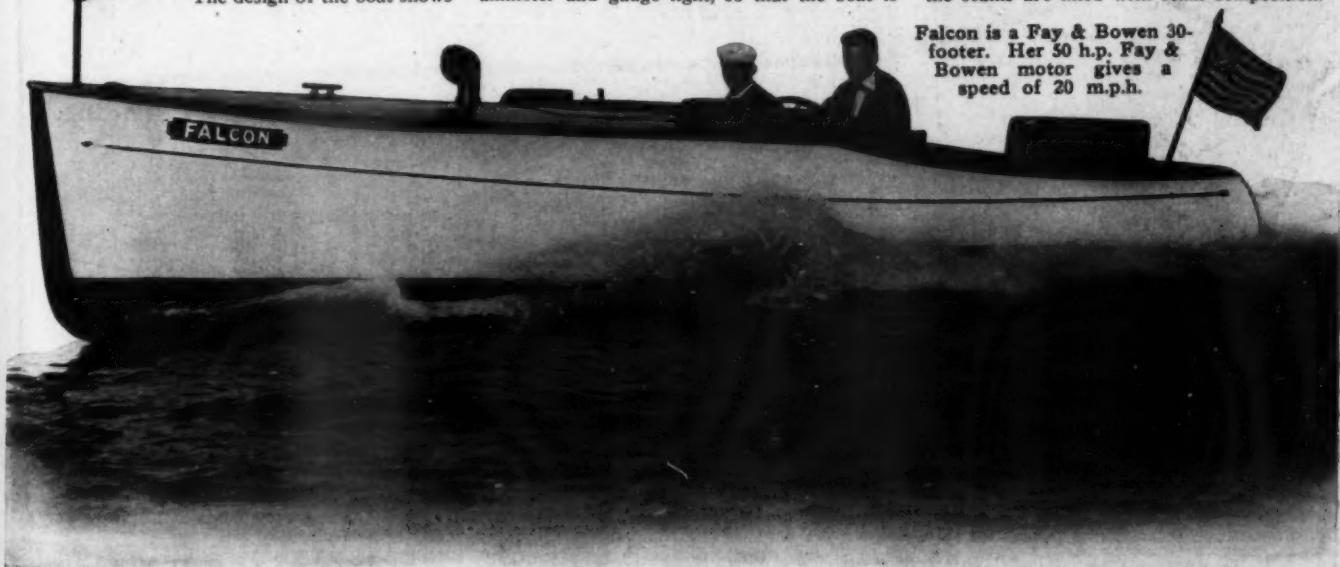
good, clean lines and the raised-deck feature gives high freeboard at a point where it insures dryness. The forward sections are also designed to maintain a low bow wave even when running at speed. The motor is arranged under the deck forward, and is equipped with Bosch-Rushmore electric starting and lighting system, complete with battery and instruments. The bulkhead assembly includes Bosch switch, ammeter and gauge light, so that the boat is

started and controlled with ease from the helmsman's seat.

The cockpit is large and roomy and its fixed equipment includes two bucket seats forward and a transom aft.

The framework is of the best white oak with copper and bronze fastenings and the planking is of Southern white cedar, copper riveted over copper burrs. The decks are laid in narrow strips of mahogany, blind nailed, and the seams are filled with seam composition.

Falcon is a Fay & Bowen 30-footer. Her 50 h.p. Fay & Bowen motor gives a speed of 20 m.p.h.



A Few Examples of American Stock Runabouts



The above illustration shows the stock 30-footer of the Albany Boat Corporation which is powered with a four- or six-cylinder Van Blerck motor, and shows a speed of 28 to 35 miles per hour. There is a comfortable seating capacity for six persons in the after cockpit, with room for two more forward.

The line of Niagara stock runabouts built by the Niagara Motor Boat Co. of North Tonawanda, N.Y., consists of five models ranging in length from 20 to 32 feet, and from 15 to 27 miles per hour. The above illustration shows a 32-foot Niagara stock runabout, and gives one an excellent idea of the quality and graceful appearance of their entire line.

The boat shown in the oval is a 26 x 6½-foot stock runabout built by the Belle Isle Boat & Engine Co., of Detroit, Mich. She is one of a stock line numbering five models, and ranging in speed from 18 to 37 miles per hour. All of these craft are of the V-bottom type, and all show good speed in proportion to their power.

The standardized cruisers and runabouts of the Elco Co. of Bayonne, N.J., are known the world over. The above illustration shows the 36-foot express runabout which with 100 h.p. gives a speed of 26 miles per hour. This runabout is almost identical in appearance with the Elco 30-footer, which is powered with a 65 h.p. motor and develops a speed of 22 miles per hour. The Elco standardized cruiser line consists of the famous 32-foot Cruisette and a 45-foot cruiser with 35 h.p.

A boat built especially for use with an outboard motor, by the Evinrude Motor Co. of Milwaukee, Wis.

Builders Standardized ^{of} Design Boats

An Alphabetical List of the Manufacturers of the Stock Boats Tabulated on Page 51

NAME OF BOAT	MANUFACTURER AND ADDRESS	NAME OF BOAT	MANUFACTURER AND ADDRESS
Albany	Albany Boat Corp., Watervliet, N. Y.	Mullins	W. H. Mullins Co., Salem, O.
Belle Isle	Belle Isle Boat & Engine Co., Detroit, Mich.	Niagara	Niagara Motor Boat Co., North Tonawanda, N. Y.
Brooks	Brooks Mfg. Co., Saginaw, Mich.	Peterborough	Peterborough Canoe Co., Peterborough, Ont., Can.
Camden	Camden Anchor-Rockland Machine Co., Camden, Me.	Racine	Racine Boat Co., Racine, Wis.
Cuthbert	A. G. Cuthbert & Co., Chicago, Ill.	Ramaley	Ramaley Boat Co., Wayzata, Minn.
Defoe	Defoe Boat & Motor Wks., Bay City, Mich.	Rehder	Rehder Boat Wks., Bayview, Ida.
Dingee	J. E. Dingee Boat Wks., Mount Dora, Fla.	Reliance	Reliance Motor Boat Co., N. Y. City.
Elco	Elco Co., Bayonne, N. J.	Rice	Rice Bros. Co., East Boothbay, Me.
Fay & Bowen	Fay & Bowen Engine Co., Geneva, N. Y.	Ripley	Ripley Mfg. & Steel Boat Co., Grafton, Ill.
Fellows	Joe Fellows Yacht & Launch Co., Inc., Wilmington, Cal.	Ross	J. H. Ross Boat & Canoe Co., Orillia, Ont., Can.
*Gene V.	Gene V Boat Co., Cincinnati, O.	Savanna	Savanna Boat Wks., Savanna, Ill.
Great Lakes	Great Lakes Boat Bldg. Corp., Milwaukee, Wis.	Sea Bright	Sea Bright Dory Wks., Long Branch, N. J.
Greenport	Greenport Basin & Const. Co., Greenport, L. I.	Smith	C. C. Smith Boat & Engine Co., Algonac, Mich.
Greenwood	Greenwood Lake Launch Wks., Sterling Forest, N. J.	Speedway	Gas Engine & Power Co., & Chas. L. Seabury & Co., Cons., Morris Heights, N. Y.
Holmes	L. C. Holmes, West Palm Beach, Fla.	Stearns & McKay	Stearns & McKay Co., Marblehead, Mass.
Hunter	Everett Hunter Boat Co., McHenry, Ill.	Toppan	Toppan Boat Mfg. Co., Boston, Mass.
Hyde	Hyde Boat & Engine Co., N. Y. City.	Valley	Valley Boat Co., Saginaw, Mich.
Lawley	Geo. Lawley & Son Corp., Neponset, Mass.	Water Craft	Water Craft Co., N. Y. City.
†Monitor	Monitor Boat & Engine Co., Newark, N. J.		

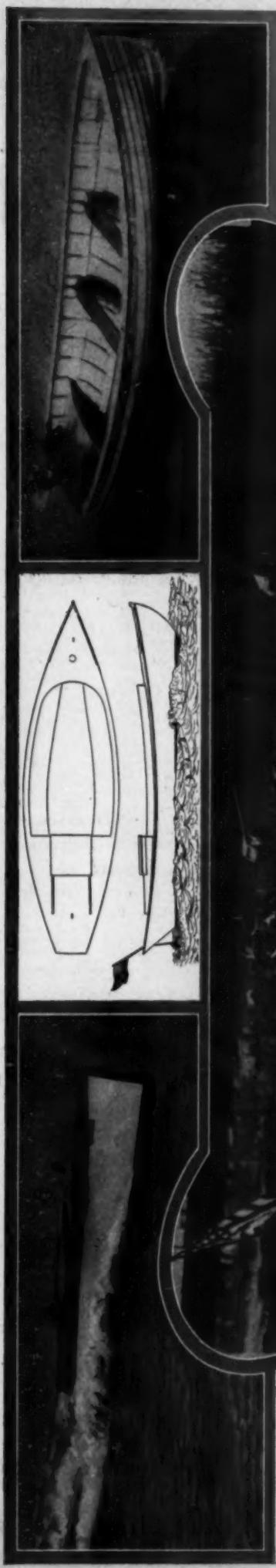
* Received too late for entry in table. See resume on page 116.
† Knock-down frames and material exclusively. All styles and sizes up to 60 feet.

Stock Boats for Outboard Motors

**A Complete Summary of All Models on the Market Which Are Built Especially for This Service—
Details as to Length, Beam, Construction, Finish, Etc.—Exclusively a MoToR BoatinG Feature**

MATERIALS USED IN CONSTRUCTION							MATERIALS USED IN CONSTRUCTION						
Length (Feet)	Beam (Inches)	Construction	Keel and Frames	Planking	Finish	Fastenings	Length (Feet)	Beam (Inches)	Construction	Keel and Frames	Planking	Finish	Fastenings
14	41	Brooks Mfg. Co., Saginaw, Mich. (K-D and Complete)	Carvel or clinker	Entire frame of selected oak	Exterior Paint; Seats and Guncables, and Varnish	Galv. Iron or Copper and Brass	12	50	Clinker	Oak	Ced. cyp.	Varnish	Cop. & brass
15	43		Carvel				14	50	Clinker	Oak	Ced. cyp.	Varnish	Cop. & brass
15	42		Carvel or clinker				16	50	Clinker	Oak	Ced. cyp.	Varnish	Cop. & brass
16	..		Clinker										
A. G. Cuthbert & Co., Chicago, Ill.							Keystone Boat Mfg. Co., Darby, Pa.						
10	44		Carvel	Oak	Ced. cyp.	Paint-varn.	14	72	Clinker	Oak	Cedar	Varnish	Copper
12	46		Carvel	Oak	Ced. cyp.	Paint-varn.							
14	44		Carvel	Oak	Ced. cyp.	Paint-varn.							
15	48		Carvel	Oak	Ced. cyp.	Paint-varn.							
16	50		Carvel	Oak	Ced. cyp.	Paint-varn.							
Defoe Boat & Motor Works, Bay City, Mich.							Kidd Kruser, New York City. (Complete with motor, cars and sail.)						
15	44		Flat bottom		Cypress	.....	14						
Wade H. Delano, Fairhaven, Mass.							Monitor Boat & Engine Co., Newark, N. J. (K-D only; many other types in K-D)						
10	..		Carvel	Oak	Cedar	Varnish	14						
12	50		Flat bottom	Oak bottom	Cedar	Paint	16						
12	52		Carvel	Oak	Cedar	Varnish	16						
14	52		Carvel	Oak	Cedar	Varnish	18						
14	52		Flat bottom	Oak bottom	Cedar	Paint	20						
Evinrude Motor Co., Milwaukee, Wis.							B. N. Morris, Inc., Vearie, Me.						
14	34		Flat bottom	Oak & rock elm	Cypress	.....	14						
16	45		Flat bottom	Oak & rock elm	Cypress	.....	16						
16	48		Carvel	Oak and elm	Cypress	.....	17						
Joe Fellows Yacht & Launch Co., Inc., Wilmington, Cal.							Peterborough Canoe Co., Peterborough, Ont.						
14	54		Carvel	Oak	Ced. spru.	Varnish	15						
Hyde Boat & Engine Co., New York City							15						
12	48		Flat bottom		Cedar	Paint	15%						
15	54		Clinker	Cedar keel	Cedar	Varnish	15						
Kennebec Boat & Canoe Co., Waterville, Me.							17						
12	48		Carvel	Oak	Cedar	Paint	17						
12	43		Carvel	Oak	Cedar	Paint	17						
12	43		Clinker	Oak	Cedar	Paint	17						
14	50		Carvel	Oak	Cedar	Paint	17						
14	44		Clinker	Oak	Cedar	Paint	17						
14	44		Carvel	Oak	Cedar	Paint	17						
16	46		Clinker	Oak	Cedar	Paint	17						
16	46		Carvel	Oak	Cedar	Paint	17						
17	36		Canvas cov.	Oak and spruce	Cedar	Varnish	14						
17	46		Sponsor	Oak and spruce	Cedar	Varnish	16						
18	37		Canvas cov.	Oak and spruce	Cedar	Varnish	16 1/2						
18	47		Sponsor	Oak and spruce	Cedar	Varnish	16 1/2						
Toppan Boat Mfg. Co., Boston, Mass.							Valley Boat Co., Saginaw, Mich.						
12	52		Carvel		Oak frames	Fine	12						
14	54		Carvel		Oak frames	Fine	14						
15	57		Carvel		Oak frames	Fine	15						
15	57		Carvel		Oak frames	Fine	15						
The Water Craft Co., New York City.							The Water Craft Co., New York City.						
15	50		Clinker		Oak	Cypress	15						

More Representative American Stock Models



A stock design built by the J. H. Ross Boat & Canoe Co. This boat is 35 feet in length by 5 feet 9 inches beam and when powered with 100 h.p. shows a speed of 30 miles per hour

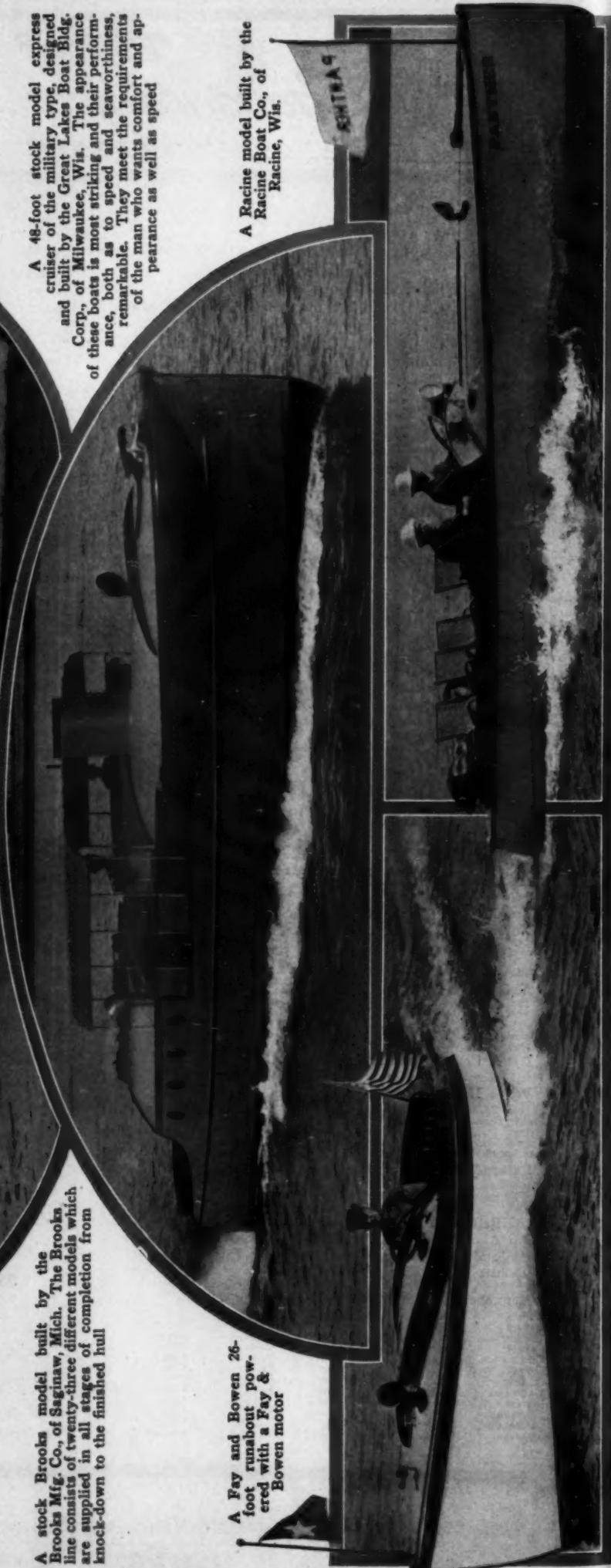
A roomy 15-foot model built by the Hyde Boat & Engine Co., of New York. The plans are of a 20-foot special offered by the Cape Cod Power Co.

A stock Brooks model built by the Brooks Mfg. Co., of Saginaw, Mich. The Brooks line consists of twenty-three different models which are supplied in all stages of completion from knock-down to the finished hull

A stock 15-foot stock model express cruiser of the military type, designed and built by the Great Lakes Boat Bldg. Corp., of Milwaukee, Wis. The appearance of these boats is most striking and their performance, both as to speed and seaworthiness, remarkable. They meet the requirements of the man who wants comfort and appearance as well as speed

A Fay and Bowen 26-foot runabout powered with a Fay & Bowen motor

A Racine model built by the Racine Boat Co., of Racine, Wis.



The Boats of Standard Design for Nineteen-Seventeen

Length, 10 to 26 Feet								Length, 26 and Over							
Length	Builder and Type	Beam	Draft	H.P.	R.P.M.	Wheel	Speed	Length	Builder and Type	Beam	Draft	H.P.	R.P.M.	Wheel	Speed
10' Hyde, tender.	4'2"	2'	4-6	900	12	x—	7.8	26' Valley, spd. rbt.	5'8"	22"	50	1,500	16	x—	45
12' Hyde, tender.	4'2"	2'	4-6	900	14	x—	7.8	26' Reliance, Cinderella.	5'2"	22"	90	1,400	18	x—	36
14' Cuthbert, tender.	3'8"	12"	3	...	...	...	...	26' Sea Bright, crsr.	7"	21"	16	800	20	x24	10
14' Toppan, hydro.	4'	16"	8-10	1,200	12	x—	18	26' Water Craft, R-D crsr.	3'6"	28"	10	600	18	x—	8½
14' Greenport, tender.	4'3"	...	3	800	12	x14	10	27' Hunter, fam. rbt.	6'6"	20"	15	...	16	x—	—
15' Brooks, Model 287.	3'7"	14"	...	...	...	...	7	28' Niagara, rbt.	5'6"	25"	35	1,100	20	x22	19
15' Racine, rbt.	4'4"	14"	8	...	...	...	12	28' Ramaley, rbt.	5'0"	24"	24	1,000	16	x20	17
16' Cuthbert, fam. rbt.	4'6"	15"	3-5	...	...	...	8-11	28' Camden, yawl dory.	6'10"	26"	11	525	22	x24	9
16' Hunter, fam. rbt.	4'6"	15"	3	...	...	...	...	28' Valley, crsr.	8"	26"	16	600	18	x—	10
16' Hyde, rbt.	4'6"	16"	5	700	12	x—	9	28' Greenport, rbt.	6'3"	24"	35	1,000	20	x24	18
16' Mullins, fam. rbt.	4'4"	14"	3	900	12	x—	9	29' Brooks, Model 236.	5'1"	14"	12-25	...	...	...	10-17
16' Ross, fam. rbt.	3'10"	18"	3	600	12	x15	7	29' Brooks, Model 263.	7'6"	24"	14	...	...	...	10
16' Hyde, dory.	5'4"	16"	2½	800	12	x—	8	30' Albany, rbt.	6'2"	24"	...	Opt.	...	...	25-35
16' Dingee, speed.	4'1"	18"	12-15	1,800	...	...	25	30' Defoe.	5'4"	25"	Standard stern runabout	...	...	...	—
16' Rehder, V-bot.	3'4"	12"	3	600	12	x—	8	30' Defoe.	6'8"	26"	Comp. stern fam. runabout	...	...	...	—
16' Mullins, hydro.	4'8"	22"	25	1,000	15	x—	28	30' Fay & Bowen, rbt.	5'6"	26"	50	1,000	...	...	20
16' Valley, hydro.	4'4"	20"	18-25	1,500	16	x—	39	30' Great Lakes, fam. rbt.	6"	25"	55	...	...	...	22
16' Water Craft, R-D crsr.	5"	8"	6	700	14	x—	7½	30' Lawley, rbt.	5'8"	24"	50	1,000	...	...	18
16' Valley, tender.	4'6"	12"	9	1,000	13	x—	14	30' Peterborough, rbt.	6"	24"	20-24	900	16	x—	16
17' Brooks, Model 286.	3'9"	6"	6-25	...	...	...	10-32	30' Ramaley, rbt.	6'4"	30"	35	...	...	...	14
17' Mullins, fam. rbt.	4'2"	16"	10	1,000	14	x—	10	30' Rose, rbt.	6'9"	27"	85	1,250	18	x28	26
17' Mullins, fam. rbt.	4'2"	16"	6	900	12	x—	8½	30' Rose, rbt.	6'9"	27"	43	1,000	18	x20	22
17' Brooks, Model 285.	4'8"	7"	...	...	...	...	...	30' Speedway, rbt.	5'6"	24"	25	800	18	x29	16
18' Brooks, Model 232.	4'1"	14"	2½-4	...	...	...	7½-9	30' Tappan, rbt.	5"	24"	45	1,000	18	x20	20
18' Fellows, open.	4'6"	12"	10	1,000	12	x—	14	30' Elco, exp. rbt.	6'2"	27"	65	1,000	18	x—	22
18' Hyde, rbt.	5"	18"	6-8	750	14	x—	9-12	30' Elco, exp. rbt.	6'2"	27"	12	1,000	18	x—	10
18' Defoe.	4'2"	18"	...	Standard stern runabout	...	...	...	30' Elco, exp. rbt.	6'2"	27"	65	1,000	18	x—	22
18' Defoe.	4'4"	19"	...	Comp. stern fam. runabout	...	...	...	30' Elco, exp. rbt.	6'2"	27"	135	1,400	18	x—	36
18' Dingee, rbt.	5"	18"	20-24	1,400	...	...	16	30' Elco, exp. rbt.	6'2"	27"	45	1,200	18	x20	15
18' Greenwood, fam. rbt.	5"	28"	3	450	14	x18	8	30' Elco, exp. rbt.	6'2"	27"	50	1,000	18	x20	18
18' Hunter, fam. rbt.	5"	14"	3-7	...	...	...	...	30' Elco, exp. rbt.	6'2"	27"	15	500	24	x26	10
18' Mullins, fam. rbt.	4'9"	18"	10	1,000	14	x—	9	30' Elco, exp. rbt.	6'2"	27"	20-35	900	16	x25	15
18' Peterborough, fam. rbt.	4'2"	18"	3	750	12	x—	8	30' Elco, exp. rbt.	6'2"	27"	25	600	22	x—	9
18' Peterborough, rbt.	4'8"	20"	4	800	14	x—	8	30' Elco, exp. rbt.	6'2"	27"	20-24	1,000	...	...	12
18' Rose, fam. rbt.	5"	20"	12	...	...	...	14	30' Elco, exp. rbt.	6'2"	27"	28"	Transom stern cruiser	...	...	—
18' Rice, special rbt.	5"	18"	8-10	900	14½-20	10	30' Elco, exp. rbt.	6'2"	27"	10	Shoal water craft	...	...	—
18' Rehder, V-bot.	4'4"	17"	4	750	14½-20	8	30' Elco, exp. rbt.	6'2"	27"	45	1,000	21	x26	20	
18' Smith, hydro.	6'7"	20"	25	1,800	20	x40	55	30' Elco, exp. rbt.	6'2"	27"	60	1,200	20	x24	22
18' Hyde, dory.	5'10"	20"	6	800	14	x—	8	30' Elco, exp. rbt.	6'2"	27"	75	1,500	18	x28	27
18' Defoe.	4'8"	10"	...	Shoal water craft	...	...	...	30' Elco, exp. rbt.	6'2"	27"	20	600	18	x—	16
18' Defoe.	4'8"	20"	...	Comp. stern fam. rbt.	...	...	...	30' Elco, exp. rbt.	6'2"	27"	10-25	...	...	...	7-12
21' Dingee, rbt.	5'2"	16"	3-8	...	...	...	7-12	30' Elco, exp. rbt.	6'2"	27"	20	...	18	x—	—
21' Hyde, rbt.	5"	20"	6-8	750	14	x—	9-12	30' Elco, exp. rbt.	6'2"	27"	125	...	...	...	32
21' Mullins, rbt.	4'9"	20"	10	1,000	14	x—	11	30' Elco, exp. rbt.	6'2"	27"	65	...	...	...	19
21' Niagara, rbt.	4'6"	20"	12	1,000	16	x20	15	30' Elco, exp. rbt.	6'2"	27"	28	1,000	Opt.	...	16
21' Peterborough, fam. rbt.	4'6"	22"	6	850	14	x—	10	30' Elco, exp. rbt.	6'2"	27"	45	1,000	Opt.	...	20
21' Peterborough, rbt.	4'8"	24"	9	800	14	x—	12	30' Elco, exp. rbt.	6'2"	27"	45	1,000	21	x26	20
21' Rose, fam. rbt.	5"	20"	6	800	14	x17	8	30' Elco, exp. rbt.	6'2"	27"	60	1,200	20	x24	22
21' Rice, special rbt.	4'4"	17"	4	750	14½-20	8	30' Elco, exp. rbt.	6'2"	27"	75	1,500	18	x28	27	
21' Rehder, V-bot.	4'2"	18"	8	600	15	x—	11	30' Elco, exp. rbt.	6'2"	27"	20	600	18	x—	10
21' Hyde, dory.	5'7"	20"	25	1,800	20	x40	55	30' Elco, exp. rbt.	6'2"	27"	30	850	22	x—	16
21' Defoe.	4'8"	10"	...	Shoal water craft	...	...	...	30' Elco, exp. rbt.	6'2"	27"	10-25	...	...	...	—
21' Defoe.	4'8"	20"	...	Comp. stern fam. rbt.	...	...	...	30' Elco, exp. rbt.	6'2"	27"	100	1,300	...	...	25
21' Dingee, rbt.	5'2"	20"	25-40	1,600	...	...	21	30' Elco, exp. rbt.	6'2"	24"	40	...	...	...	22
21' Fay & Bowen, rbt.	5'2"	22"	5	850	16	x—	8	30' Elco, exp. rbt.	6'2"	24"	100	1,275	20	x—	28
21' Greenwood, rbt.	5'2"	24"	10	850	16	x20	12	30' Elco, exp. rbt.	6'2"	24"	125	...	...	...	27
21' Greenwood, fam. rbt.	6"	28"	5	600	16	x—	8	30' Elco, exp. rbt.	6'2"	24"	65	1,000	19	x30	25
21' Hunter, fam. rbt.	5'2"	15"	7-10	...	...	...	...	30' Elco, exp. rbt.	6'2"	24"	60	1,000	19	x30	24
21' Mullins, rbt.	5'2"	20"	12	1,000	14	x—	14	30' Elco, exp. rbt.	6'2"	24"	60	1,000	20	x32	30
21' Tappan, rbt.	5'2"	20"	12	1,000	22	x—	14	30' Elco, exp. rbt.	6'2"	24"	100	1,250	20	x30	30
21' Reliance, Cinderella.	4'8"	20"	30	1,100	16	x—	20	30' Elco, exp. rbt.	6'2"	24"	200	1,400	...	...	—
21' Defoe.	5"	18"	V-bottom runabout	...	...	...	...	30' Elco, exp. rbt.	6'2"	24"	20	...	...	...	—
21' Sea Bright, dory.	6'1"	18"	11	800	20	x20	10	30' Elco, exp. rbt.	6'2"	24"	20	...	...	...	—
21' Speedway, tender.	5'9"	22"	28	1,200	18	x18	15	30' Elco, exp. rbt.	6'2"	24"	20	...	...	...	—
22' Brooks, Model 283.	4'6"	8"	...	...	...	...	...	30' Elco, exp. rbt.	6'2"	24"	20	...	...	...	—
22' Brooks, Model 230.	5'4"	18"	4-8	...	...	...	...	30' Elco, exp. rbt.	6'2"	24"	20	...	...	...	—
22' Hunter, fam. rbt.	5'2"	16"	7-10	...	...	...	...	30' Elco, exp. rbt.	6'2"	24"	20	...	...	...	—
22' Mullins, rbt.	5'2"	20"	12	1,000	14	x—	12	30' Elco, exp. rbt.	6'2"	24"	20	...	...	...	—
22' Tappan, Gov't.	5'2"	24"	35	550	18	x18	8	30' Elco, exp. rbt.	6'2"	24"	20	...	...	...	—
22' Camden, yawl dory.	6'2"	22"	8	800	15	x—	8	30' Elco, exp. rbt.	6'2"	24"	20	...	...	...	—
22' Hyde, dory.	6'2"	17"	6	600	...	...	...	30' Elco, exp. rbt.	6'2"	24"	18	...	...	...	11
22' Tappan, dory.	6'2"	10"	6-12	...	...	...	9-14-14	30' Elco, exp. rbt.	6'2"	24"	25-35	800	...	...	12-18
22' Brooks, Model 234.	5'2"	21"	10	800	16	x18	9	30' Elco, exp. rbt.	6'2"	24"	35	...	...	...	10
22' Ross, fam. rbt.	5'2"	21"	10	800	16	x20	18	30' Elco, exp. rbt.	6'2"	24"	35	500	24	x34	12
22' Racine, rbt.	4'10"	22"	25	1,000	18	x—	22	30' Elco, exp. rbt.							

A Successful 39-Foot Cruiser

Raised-Deck Type of Racine Boat Which Is Being Built for a Customer in Portuguese East Africa—Scripps Motor Gives Good Speed and Layout Provides Generous Accommodations

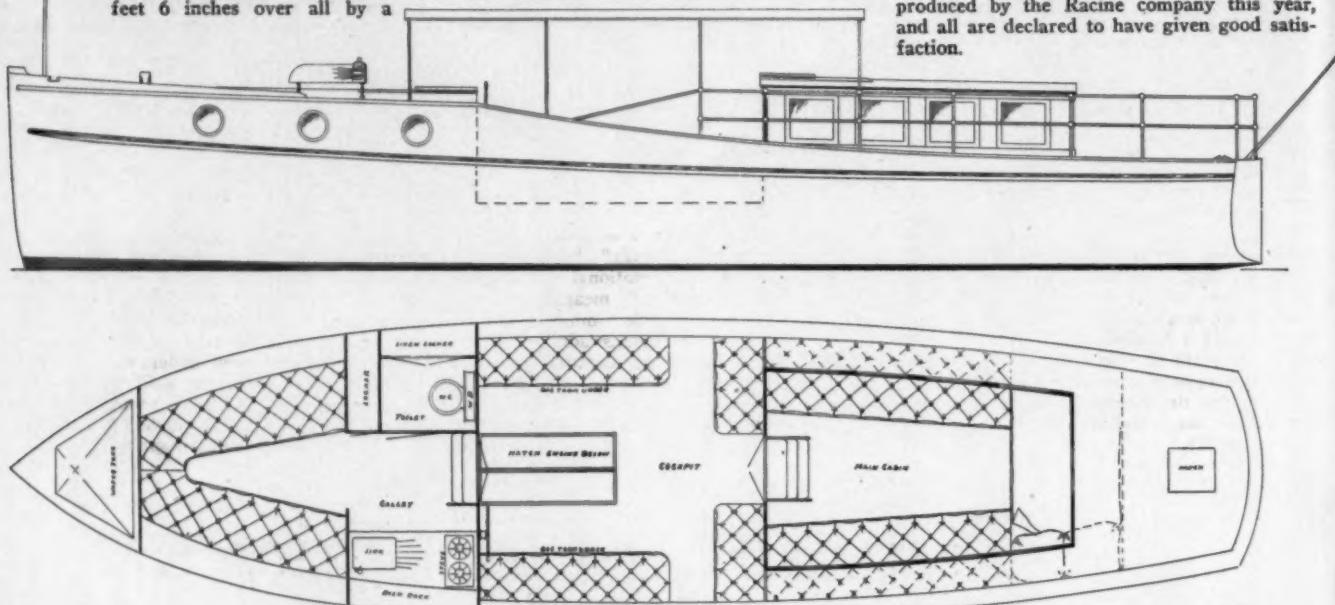
THE accompanying designs show a raised-deck cruiser which the Racine Boat Co., of Racine, Wis., is building. When completed the boat will be crated and shipped to Lourenco Marques, Portuguese East Africa, where the prospective owner, Adriano Maia, makes his home. The cruiser is 39 feet 6 inches over all by a

beam of 9½ feet and 2½-foot draft. She is being constructed to give the fullest amount of service and satisfaction and to withstand rough water. The speed also will be good, and a six-cylinder Model EB Scripps motor is specified for the power plant.

There are two staterooms, giving sleeping accommodations for ten persons. One of these

is in the bow and is followed on the starboard side by the toilet with the galley opposite the latter. There is a roomy cockpit amidships from which the boat is controlled, and the engine is installed beneath this deck. Aft is the main cabin, equipped with double bed and transom berths.

Several cruisers of the same type have been produced by the Racine company this year, and all are declared to have given good satisfaction.



Accommodations for sleeping ten persons are allowed in the arrangement of this cruiser. There is ample seating capacity in the steering cockpit amidships

U.S. Power Squadrons Plan Winter's Work

A Series of Instruction Meetings Prepared to Keep Members of Local Squadrons Interested—Much Work Along Educational Lines Which Should be of Interest to Every Motor Boatman

THE by-laws of the United States Power Squadrons provide that each squadron shall hold at least four instruction meetings during the year. In order that the meetings might be uniform in their scope, a number of standard sets have been planned. Each provides winter work laid out along certain definite lines, which are more or less progressive, and option is given to the local squadrons to choose the particular series which interests them most.

In planning the instruction meetings the instruction committee has kept in mind the fundamental object of the squadron movement, i.e., "To develop men, not boats." It has realized that there are some elementary rules that should never be forgotten, and that a review of these points is valuable to all members—even to those of the longest standing.

The committee has also realized that there is a desire on the part of many members to take up more advanced subjects, including certain nautical knowledge of a nature which they themselves might never have to apply, although having great interest in them. Furthermore, the committee believes that a course should be provided leading up to the title of junior navigator, and also that those members who are interested in the naval side of motor boating should be provided for also. The following programme of instruction meetings has been prepared:

Series A. Preparatory and Elementary.
(Thoroughly covering the subjects necessary to pass the first examination for member's certificate.)

Series B. Elementary Review and Practice
(Note: These questions will be found on pages 80 and 86)

tical Compass and Chart Study.

(A résumé of the things which one should never forget, including more advanced work with the compass, chart and piloting.)

Series C. Junior Navigator's Course.

(Covering the subjects necessary to know to pass the examination for Junior Navigator.)

Series D. Special Power Squadron Work.

(Power Squadron drills, search problems, Signaling by International Code, Morse Code, wigwag and semaphore.)

Series E. Miscellaneous.

(Weather, knots, splices, first aid to the injured, medical, U. S. life saving service, Government publications, maritime law, etc.)

Series F. Nautical Instruments.

(Two illustrated lectures describing the various instruments used in navigation and two meetings aboard a motor yacht to get familiar with the use of the instruments.)

Series G. Advanced Navigation.

(Compass adjusting, use of sextant and other nautical instruments, determination of latitude, longitude, etc.)

Series H. Naval Studies.

(A series of four lectures by Naval officers, given in the larger cities on use of motor boats for war purposes, civilian cruises, etc.)

Series I. Large Vessel Handling.

(A series of four lectures by officers of the merchant marine.)

Each series consists of four meetings, lectures, quizzes or talks, as the case may be. Some of these will be illustrated by means of lantern slides prepared and loaned by the central committee on instruction, others will be talks by approved lecturers, while many will be in the form of classes with one member acting as leader, and the others entering into the discussion. In such a case the members will be expected to provide themselves with the textbooks recommended by the committee. The

organization hopes, in time, to prepare its own text books which will be best suited to the Squadron needs. For the advanced courses in navigation, etc., it is expected that there will be a limited number of instruments available for loaning to the squadrons.

As showing just what the instruction meetings contemplate, it is interesting to go more into detail concerning the courses. Thus, Series A, which is preparatory and elementary, consists of four lantern lectures, as follows: No. 1—Rules of the road, rights of way, whistle signals, buoys; No. 2—Lights carried by various classes of boats, Government Navigation lights, Government publications, Government equipment; No. 3—The compass and the chart; No. 4—The log and the lead lines, flags and how to fly them, signaling, drills.

Series B, which comprises an elementary review and the study of compass and chart, is arranged for four discussion meetings:

First meeting: (1) Thoroughly discuss questions and subdivisions I to V inclusive, (see note below). (2) Carefully describe the compass card, making clear the system of naming the points and quarter points by the two methods and the different ways of numbering the card in degrees. (3) Explain variation and deviation and how to change a magnetic or true course to a compass course, and vice versa.

Second meeting: (4) Review briefly by quiz the work of the previous meeting. (5) Thoroughly discuss questions VI to VIII inclusive. (6) Explain the chart (the meaning of all the signs and the legend), aids to navigation, and the use of the parallel rulers and course pro-

tractor in laying a course from one point to another on a chart.

Third meeting: (7) Review briefly by quiz the work of the two previous meetings. (8) Thoroughly discuss questions IX to XV inclusive. (9) Give Bowditch's chapter on piloting.

Fourth meeting: (10) Review briefly the work of the three previous meetings. (11) Thoroughly discuss questions XVI to XXIV inclusive. (12) Hold a general discussion, bringing out the points that are vague and not clearly understood.

Four meetings are planned for Series C, which is the Junior Navigator's course, the work being laid out as follows:

First meeting: General discussion of questions I to XXIV inclusive, in Series B (excepting XX).

Second meeting: Lantern lecture on proper colors to fly, weather and distress signals, various methods of signaling, International Code flags and their fundamental meanings when flown in two, three and four flag hoists, explanation of laws of storms, illustration of use of oil, engine-room signals.

Third meeting: Entire evening spent with chart, laying out courses, applying compass errors, locating one's position by various methods, bearings, use of the various Government publications, keeping charts and records up to date—in fact a detailed study of the compass and piloting chart. (In this meeting the elementary compass discussion is omitted, the aim being to give the member a thorough knowledge of the chart and the information necessary to use it).

Fourth meeting: Dead reckoning and determination of latitude by meridian altitude of the sun. Elementary practice in the use of a sextant. Use of nautical almanac, equations of time, changes from apparent to sun time, use of Government tables found in Bowditch, etc.

Series D takes up special Power Squadron work, and is one of the most advanced and interesting of the course. In the first meeting the members are expected to learn the International Code flags. Practise distinguishing the various International Code flags and memorize the flag which represents each letter, and vice versa. Learn the weather flags and their meanings. Learn the storm flags and their meanings. Practise Power Squadron maneuvering signals, repeating from memory what each signal means, and the proper way to execute same. Demonstrate by means of models of boats the various positions the boats should take when the different signals are displayed and hauled down. Discuss the Tactical Suggestions given on pages 28-37 of the Drill and Code Book.

Second meeting: Signaling by means of International Code. "How to Make a Signal," "How to Answer a Signal." Study the arrangement of the International Code Book. What is the fundamental meaning of one-flag, two-flag, three-flag and four-flag signals? Discuss the standard signals adopted by the U. S. life saving service. Discuss and study the Morse Code:

Third meeting: Thoroughly familiarize yourself with the Morse Code. Practise signaling by means of Morse Code wigwag.

Practise signaling by means of Morse Code with blinker lights. (Note: This entire meeting is given up to Morse Code signaling, both with flags and blinker lights.) During the first part of the meeting, one familiar with and accustomed to the Morse Code, signals by wigwag and blinker lights to the rest of the class, who should practise receiving the messages. During the last half of the meeting the class is divided up into groups of two, each of which should practise sending and receiving messages with his partner. A record in writing should be kept by every member of every message he sends or receives, and used for checking. The last exercise of the meeting consists of stationing the class around the room, and starting a message with the first man who sends it to the member adjacent, who after he has received it, sends the same message to the next member, and so on until the message has been sent entirely around the room, and back to the first man. The message received should then be compared with the one started to see if the two are identical.

Fourth meeting: Review Morse Code signaling. Learn the semaphore system. Practise the semaphore system according to the scheme outlined in the third meeting.

During the meetings of this series the question of Power Squadron drills is given serious consideration. New ideas should be formulated as to what is to take the place of those things which are now understood to be the necessary maneuvers for drill periods after the members have become proficient in this work. Such things as night drills, search

(Continued on page 80)

Triton II, of

A Sturdy 40-Footer of Deed Design Which Has Figured the Windy City—Her 24 H. P. Anderson Motor Gives

THE 40-footer which was made from the accompanying designs won second prize last summer in the cruiser race from Chicago to Michigan City, and has further distinguished herself as an excellent sea boat. She was designed by William J. Deed, Jr., of Boston, Mass., and was built by Peter Kargard, of Chicago, for O. B. Carlisle of the same city. She has a beam of 10 feet and a draft of 3 feet 9 inches, and she is powered with a four-cylinder 5 x 6-inch Anderson motor developing 24 h.p.

Her arrangement is an attractive one for a boat of this length. As will be seen from the plans, she is laid

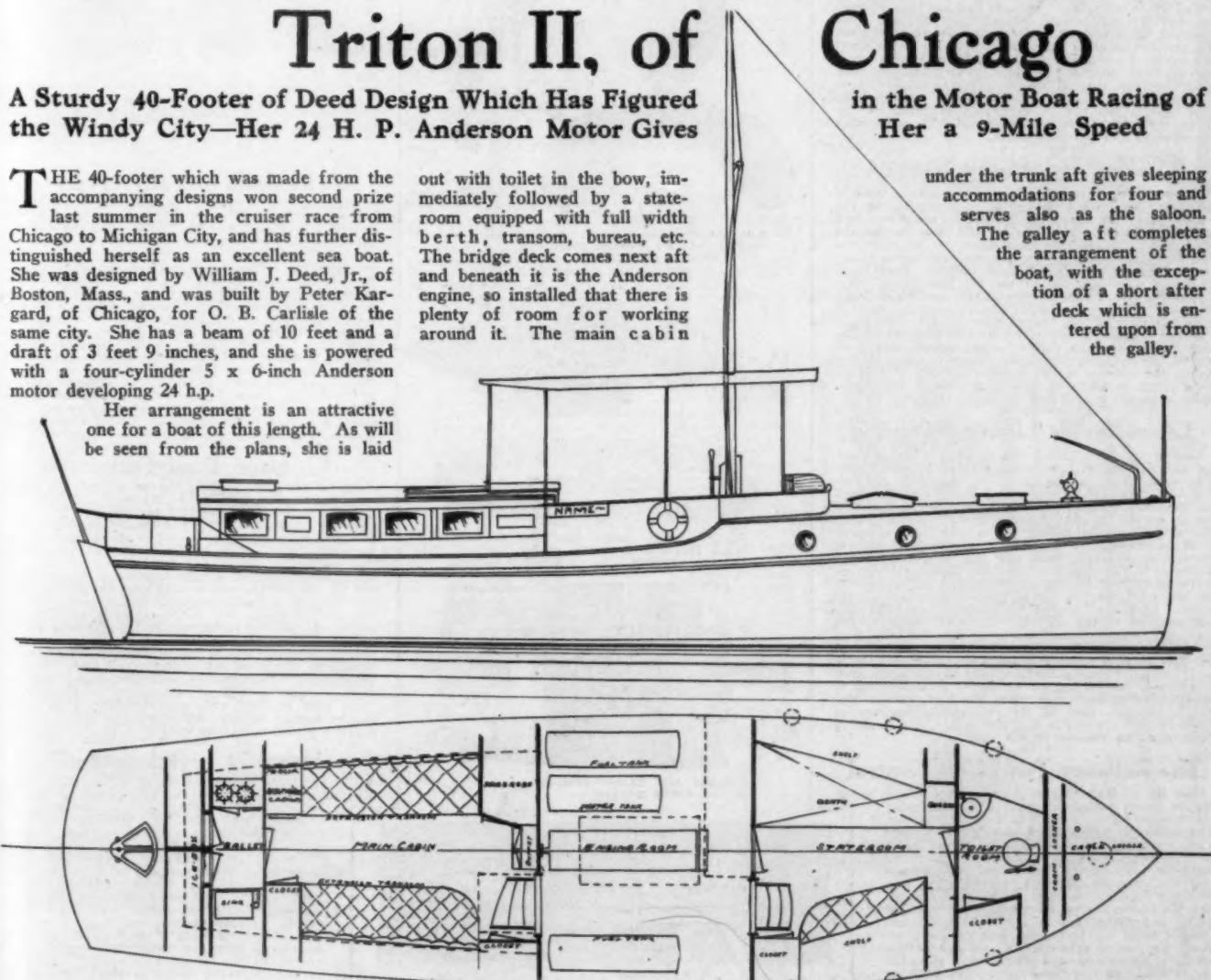
out with toilet in the bow, immediately followed by a stateroom equipped with full width berth, transom, bureau, etc. The bridge deck comes next aft and beneath it is the Anderson engine, so installed that there is plenty of room for working around it. The main cabin

Chicago

in the Motor Boat Racing of Her a 9-Mile Speed

under the trunk aft gives sleeping accommodations for four and serves also as the saloon.

The galley aft completes the arrangement of the boat, with the exception of a short after deck which is entered upon from the galley.



Triton II, whose plans are shown above, is a strongly constructed cruiser of good seaworthiness and comfortable speed. Her keel is five inches in thickness and her other structural dimensions are in proportion

Nineteen-Seventeen Equipment & Accessories for Motor Boats

Cello Lighting Outfits

The A. S. Campbell Co., of Boston, Mass., is the manufacturer of complete lighting outfits for motor boats, including such specialties as electric running lights, searchlights, cabin lights and so forth. One of the illustrations on this page shows the Wire-less side light. The construction of this light is such that any possible chance of short-circuiting is eliminated. All the wiring is done below deck, and the only exterior equipment is the flush-deck socket, which when not in use is rendered water-proof by a tightly fitted cap. Wire-less lights are made in different sizes for Class 1, 2, and 3 boats.

The Cello Wire-less stern light is not only a new item of this line, but is interesting because of its practicability. The Wire-less system of boat lighting is declared to be meeting with wonderful success throughout the motor boating trade in general.

Hyde Propellers

The Hyde Windlass Co., of Bath, Me., has just issued its 1917 catalogue of its products. While there has been no addition to the Hyde line, the catalogue is of especial interest to the boat owner, as it is filled with photographic reproductions of Hyde-equipped craft of every description. Among these are the record-breaking hydroplane Miss Minneapolis, the fast Conejo and the United States battleship Pennsylvania, for which the Hyde company furnished the propellers. Hyde turbine type propellers are made of the celebrated Hyde manganese bronze, and are designed on the true screw principle. This, combined with their generous blade area, is declared to make them efficient and smooth-running at all speeds. The Hyde No-Weed is a weedless wheel that combines efficiency with weedless qualities, and the Gale is a lower-priced propeller than the Hyde, that is cast from regular Hyde turbine type patterns. While the material and finish of the Hyde wheels are not as expensive as those of the Hyde, these propellers are giving splendid satisfaction for slow- or medium-speed work.

Leak-Proof Piston Rings

Wherever power is produced by pressure upon a movable piston, its effectiveness is measured by the piston ring. Practically all new motors come equipped with the old-style one-piece ring, and in a few months of service they are extremely liable to lose compression and permit oil to work into the combustion chamber and cause the formation of carbon. Leak-Proof rings are manufactured by the McQuay-Norris Mfg. Co., of St. Louis, Mo., to correct this condition. They are made of two concentric L-shaped sections, each of equal strength, fitted one closely against the other. Opposite expansion centers in the two sections of the Leak-Proof allow the ring to secure equal tension all around the cylinder walls, the flange in each section sealing the opening in the opposite center. The Leak-Proof ring is made of special processed gray iron which is tough, smooth and of lasting elasticity.

Leece-Neville Lighting Outfits

During the 1916 season the two-unit electric starting and lighting systems manufactured by the Leece-Neville Co., Inc., of Cleveland, O., gave such satisfaction that they will be continued practically unaltered for the 1917 trade. Over two thousand outfits were put in service on motor boats throughout the world. The modern engine builder has realized that a power plant is incomplete without a satisfactory electric starting motor, and there are few engine manufacturers of to-day that have not yet made provision so to equip their products. Leece-Neville two-unit outfits are made in two types—the rectangular and the round. They are designed in this manner so that they will conform to the different styles of engines being built by various manufacturers. So that the boat builder may place the storage battery in any part of the boat he desires, these systems are made to operate at 24 volts. Where a lower voltage is used, the drop in potential caused by the resistance in the wiring is considerably greater than when the high voltage system is in use. One of the outstanding features of Leece-Neville systems is that the motor boat owner is given one-man control of his craft.

The Reliance Twin Unit Control

The W. S. Hall Co., of Rochester, N. Y., is entering its fourth successful year of manufacturing the newest types of marine steering controls. The company has studied closely the newest yacht designs, and is continually adding to its already large line. The recently introduced Reliance unit system met with such success that the company has now perfected the new Reliance twin unit control. This gear centralizes the entire control of the twin-screw motor yacht, embodying as it does separate spark and throttle arms for both port and starboard engines, the reverse gear operation of both motors, the steering control and the control of either the electric signal or the starter. The Reliance differs from the ordinary cruiser gear in that it is mounted on a bronze pedestal with the



engine controls installed within the wheel and with the reverse levers of a new folding type which drop down parallel with the pedestal when not in use. In addition to this new outfit the company still manufactures its regular line, including thirty different styles of steering gears.

Carlisle & Finch Searchlights

The Carlisle & Finch Co., of Cincinnati, O., calls attention at this time to its "submarine" searchlight, which is used on torpedo-boat destroyers, but which is so handy and portable that it can be installed on any high-grade yacht or motor boat. The supports of this nine-inch searchlight are so arranged that it fits into a socket that is permanently attached to the railing of the vessel. The searchlight may be lifted out and carried below when it is not in use. The light is fitted with a nine-inch glass mirror of special construction, which is accurately ground to throw a straight beam of light. The entire mechanism and internal apparatus is made of bronze or brass, and the usual finish is dead black, although the instrument can be furnished in polished brass if desired. An article of extra equipment on this searchlight is a signaling shutter, whereby flashes of light may be thrown for signaling or telegraphing between vessels. Such an adjustment would be highly valuable to the owner of a motor patrol boat.

The Baby Michigan Standard Gear

As an addition to its line of reverse gears for marine uses, the Michigan Standard Gear Co., of Detroit, Mich., has just placed on the market its "Baby" gear, which has been designed especially for small boats. This gear is light and compact, weighing only 35 pounds and measuring but 14 inches in overall length. It delivers about $\frac{3}{4}$ h.p. for each 100 r.p.m. of the motor up to 900 revolutions—or about 7 h.p. All gears are made in the manufacturing company's own shops from a special grade of steel, and are scientifically heat-treated. The gear itself is neat in appearance, and is priced at \$17.50. This company expects to announce within a very short while other designs which are now going through.

Ilanaisilk Life Preservers

Realizing the importance of having every efficient buoyant device possible on motor boats, the Universal Safety Mattress Co., of N. Y. City, has developed an extensive line of life-saving equipment. These articles are filled with Ilanaisilk, and the line includes life preservers stamped and passed by the United States Steamboat Inspector. One form is a comfortable pillow upon which the passenger may rest his head when asleep, and other articles include safety mattresses, seat cushions, motor boat cushions, swimming belts, aviators' life preservers, chair cushions, etc. Ilanaisilk is manufactured exclusively by the Robinson-Roders Co., of Newark, N. J., from the highest quality Java fiber, imported directly to the factory. According to the makers, it is the only soft filling material approved by the United States Steamboat Inspector for stamped and passed life preservers for use on all vessels. This material is used in the entire line of these equipments, so that their quality and integrity are assured.

Kingston Dual Carbureter

As an addition to their extensive line of carbureters, Byrne, Kingston & Co., of Kokomo, Ind., have introduced the Kingston dual carbureter, which is designed to meet the rapidly increasing demand for a practical instrument capable of handling kerosene and some of the lower-grade distillates. In construction this carbureter is a dual combination of the well-known enclosed type Kingston, one side being adapted for the use of kerosene or distillates and the other for gasoline. If desired, the latter fuel may be used not only for starting, but for continuous running, and either unit of the carbureter is brought into communication with the manifold and motor through the agency of an integral three-way valve. Both units are subject to individual adjustments and may, therefore, be operated on either fuel with a maximum economy. Should water be required, a small valve which is provided may be used with good results. This is very simple, having but one adjustment. Preheated air is supplied to the intake on each side of the carbureter.

Henricks Lighting Outfit

The Henricks Magneto & Electric Co., of Indianapolis, Ind., has one of the most complete lines of electric lighting outfits on the market at the present time. The little five-light system is suitable for boats ranging in size from 20 to 35 feet; the ten-light outfit for boats from 35 to 55 feet, and the twenty-thirty outfit is suitable for larger craft. The little BC-4 generator, the type that is used with the five-light outfit, occupies very small space and can be installed in almost any boat. Being of the permanent magneto type, it requires but little power to run it, and, therefore, does not interfere with the output of the engine to any appreciable extent. According to the Henricks company, these lighting sets have been sold in all parts of the United States, and are now being shipped to some

A demonstration of various types of Ilanaisilk life preservers

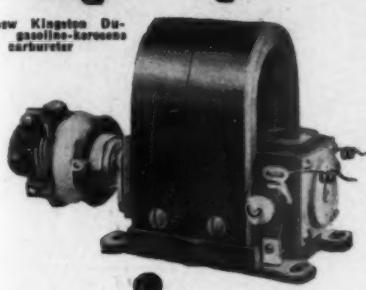
• Nineteen-Seventeen Equipment & Accessories for Motor Boats •



The new Kingston Duplex gasoline-kerosene carburetor



Columbian propellers for every type of motor boat



The G-E mercury arc rectifier which is used for charging storage batteries

BC-4 generator, used with the Neurick five-light electric system



Wicker-Kraft life belt chair which provides a convenient place for stowing a life preserver



One of the enclosed-type ball bearing gears made by the Carlyle Johnson Machine Co.



Master case and base which may be used as a life preserver



Cut-out used with the Carleton generating equipment

Three types of circulating pumps made by the M. L. Oberdorfer Brass Co.

TYPE-A FORM-Y

TYPE-B FORM-Y

TYPE-C FORM-Y

of the foreign countries. The concern has substantial accounts in Australia and New Zealand, and has made sales in Russia, England, Cuba and some of the South American countries.

The General Electric Rectifier

The General Electric Co., of Schenectady, N. Y., manufactures a mercury arc rectifier which is used to charge motor boat storage batteries. It is a fact known to intelligent owners of motor craft that to obtain the best services from their storage batteries the latter should be charged and discharged with periodic frequency. In the summer, when the boat is constantly in use, this matter will take care of itself if a generator is part of the equipment. At this time of year, however, when a great many boats are laid up for the winter, some outside means must be taken to charge the battery, and for this purpose the G-E rectifier is especially useful. It converts the alternating current of a house lighting system to direct current and reduces the voltage to the required amount. The instrument consists of a metal base on which are mounted the necessary reactance coils and rectifier tubes. An attaching plug is supplied, which may be inserted in any lamp socket, and there are also two binding plugs distinctly marked with the plus and minus signs, from which wires are run to the battery or batteries to be charged. The device weighs about fifteen pounds, and is easily removed. Tipping the rectifier slightly will start it, and no further attention is necessary until the battery is charged and the current shut off. The statement is made that this instrument is very inexpensive in operation.

Wicker-Kraft Life Belt Chair

The Wicker-Kraft Co., of Newburgh, N. Y., has had great success with its life belt chair. This is a typical Wicker-Kraft deck chair which, however, is made with a compartment underneath the seat, wherein a life preserver may be stowed. Its advantage lies in the fact that the life preserver takes up no additional room in the cockpit, will keep clean and dry and is instantly accessible for use if wanted quickly. The owner of chairs of this type is thus enabled to keep his life preservers in good condition for several seasons. The accompanying illustration makes clear the simplicity of the design of this chair.

Carlyle Johnson Products

The Carlyle Johnson Machine Co., of Manchester, Conn., is now receiving from quite a few of the leading motor manufacturers orders for its products, particularly the marine reverse gear, which is being put out for 1917 in sizes to handle any power from the lowest up to 60 or more at 1,000 r.p.m. This concern has had fifteen years of experience in manufacturing reverse gears of the enclosed type, and so may be expected to put out a highly satisfactory article along these lines. A predominant feature of Johnson gears is the method of mounting the shaft on ball bearings, which allows the highest percentage of the actual horsepower of the motor to be transmitted to the propeller. This ball-bearing type of gear is easy to lubricate and adjust as well as to install. The shafts and gearing are of alloy steel, of one of the best grades obtainable, properly hardened and heat-treated. The principal specifications of the Bud-E marine motor, made in two sizes by this concern, will be found in the pages of this issue devoted to a tabulation of marine motors.

Carleton Electric Equipment

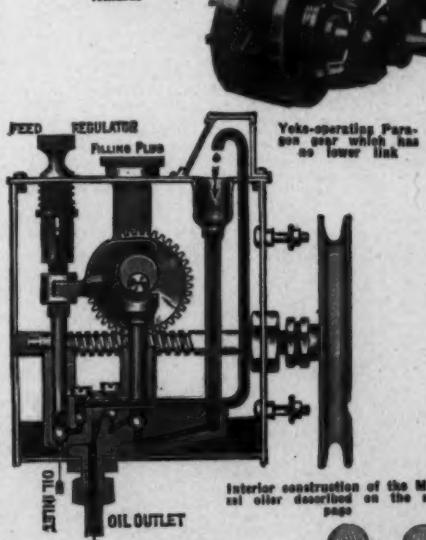
The Carleton Co., of Boston, Mass., has for three years manufactured a lighting outfit for motor boats and yachts which may be applied equally as well whether the craft is in the process of manufacture or is already in commission. It consists, briefly, of a generator or dynamo, storage battery, automatic cut-out and ammeter. The generator may be driven by a friction pulley from the flywheel, by belt, by chain and sprocket or by gears, the method of drive being entirely a matter of convenience. The problem is to drive the generator at a speed sufficient to furnish the amount of current required for the lights, and this varies according to the size of the boat. The storage battery may be omitted from the equipment, if desired, but this practice is hardly to be commended for any type of marine electrical installation. All the articles that go into the make-up of the Carleton outfit are stated to be of the highest quality.



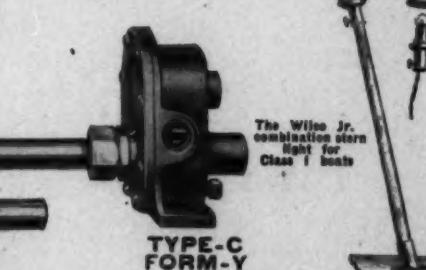
Cutaway view of the Dunn Divisional rear safety start with adjustable frame



The Navy wireless made by Wilcox, Crittenden & Co. has several valuable features

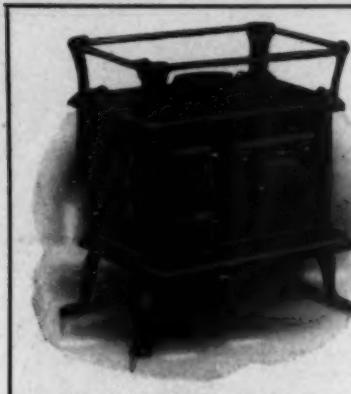


Interior construction of the Marine oiler described on the next page

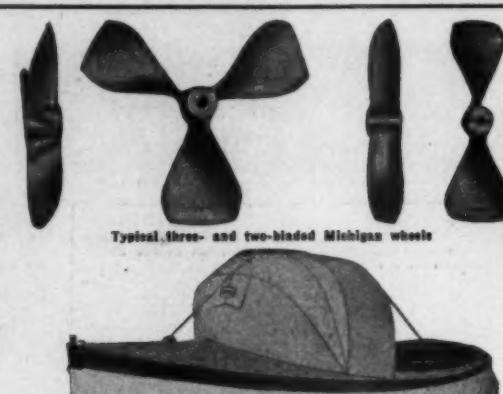


The Wilco Jr. combination stern light for Class I boats

Nineteen-Seventeen Equipment & Accessories for Motor Boats



One of the well-known Shipmate ranges



Typical three- and two-bladed Michigan wheels



A Polaric compass with the Cole bearing finder in position

Masten Tops

The G. H. Masten Co., Inc., of New York City, has completed a very satisfactory year, and is planning material increases in its manufacturing capacity for 1917. Spray hoods, canvas work, boat canopies, life preservers, curtains, dispensers and upholstery are some of the things specialized in by the marine department of this concern, and for next year there will be a new one-man top added to the present line which is expected to be superior to anything now on the market. New designs are also being prepared for life preservers, life preserver cushions and life belts.

Oberdorfer Pumps and Gears

The M. L. Oberdorfer Brass Co., of Syracuse, N. Y., announces that it is prepared to execute orders for bronze and aluminum gears and pumps in any quantity for the positive circulation and distribution of oil or water in marine engines. There is nothing intricate or delicate about the construction of these pumps, their designer having in mind accessibility and durability. They are so constructed as to be readily adaptable to any motor, and the illustration on page 53 gives an idea of a few of the styles and types in which the stock pumps are produced. Unlimited facilities are also available to produce pumps in accordance with blueprints should a special design be required.

The finished bronze bushing and bearing held has also been invaded by this progressive concern, and since the inception of its new department it has produced upwards of one million finished bronze bushings.

Columbian Propellers

No special introduction is needed for Columbian propellers, manufactured by the Columbian Brass Foundry, of Freeport, L. I., as they are known to motor boatmen in all parts of the country. A propeller of any diameter and pitch from seven inches to seven feet can be found in the Columbian line, and eight different types of wheels will enable the boat owner to equip his boat, no matter what size or type it may be, according to its exact needs. These propellers are made of the highest grade of manganese bronze, tests of which are declared to have run as high as 81,000 pounds' tensile strength per square inch. The material is guaranteed, and if a propeller is broken in use it will be replaced without charge. The Columbian guarantee also includes accuracy of pitch, which means that the pitch is warranted correct on each blade and at every point on each blade, while the guarantee also embraces balance.

The Columbian line also includes a complete assortment of bronze struts and rudders for all types of boats, and has as one of its features the Columbian foot control, which renders the operation of a runabout a matter of extreme simplicity.

Joe's Gears

As is well known, these gears are made by the Snow & Petrelli Mfg. Co., of New Haven, Conn. The company reports an unusual harvest of advance orders for the coming season, and from the present outlook anticipates the biggest trade in its experience. One factor which makes it important for the motor manufacturer to get in his orders early is the condition of the metal market, which with the overrunning of transportation oftentimes causes delay in deliveries.

Prominent in the line of Joe's gears is the Duplex Drive, which was designed especially for heavy-duty motors requiring a high ratio of reverse. These gears have not only proven their excellence in the class of work, but their compactness, balance and freedom from back lash make them desirable for medium and high-speed motors as well. Joe's one-way clutch is an efficient cut-out instrument which adapts itself readily to fishing boats where hauls are required, and is, in fact, an all-around clutch where reversing is not an important feature. Joe's positive neutral one-way clutch is adapted for high-speed racing boats where the propeller must be held against possible rotation in neutral, and Joe's safety rear starter is another product of this concern which occupies a high standing in the industry.

The Dunn Divinhood

C. D. Durkee & Co., of N. Y. City, who carry an unusually complete line of marine hardware, have been devoting a prominent part of their energies recently to the popularization of the Dunn Divinhood.

The McClellan Simplicity spray hood attached to an open boat



As described in the picturesque and graphic language of the Durkee Co., this device resembles an overgrown silk hat. It is placed on the head, and with fifty pounds of lead weights, and a little pump, anyone can go down in the water and remain submerged for hours. The copper hood itself weighs ten pounds, and yet when one is under water the total weight of the apparatus is less than one-half pound. The Divinhood has been tested out severely by various departments of the Government, and, while it is being used for departmental work, it is particularly adapted for the use of the private motor boat owner or to the yacht clubs. With an instrument of this kind, one may go down to a depth of twenty feet and perform such work as recovering anchors, repairing struts and disentangling or removing propeller wheels.

Another Durkee specialty is the Eells stockless anchor, which, owing to its design, is declared to do the work of any anchor of exactly double its weight.

W-C Windlass and Steerer

Wilcox, Crittenden & Co., of Middletown, Conn., manufacture the Navy windlass, which embodies several unusual features. It enables the boatman to heave on a line, and makes provision for letting chain cable run free and for stopping at any point. All three of these movements are controlled by the heavy lever without changing the position of the hand, one operation following the other at the will of the operator. The Navy windlass is fitted with a drum or winch head for manila cable and with a wildcat to take care of chain cable. As many craft use chain cable on the light anchor for daily use and manila cable when riding to the heavy storm anchor, the combination of drum and wildcat is a decided advantage. The winch head and wildcat, however, are both on the same shaft and do not work independently. The Navy is a strong and reliable windlass designed to take care of anchors up to 150 pounds in weight, and it is simple in construction and easily lubricated.

This company has constructed a single-tube low-priced steerer of the automobile type, which is recommended for small boats. It is accurately machined and well made throughout, but it differs from the highest-grade type of W-C auto steerer in that it has no inside steering post to reinforce it. This model is equipped with wood instead of brass drum, as is the case with the more expensive type, and the spider has three instead of four spokes. It is equipped with spark and throttle controls, and the rim is of laminated maple, mahogany stained.

Paragon Gears

The Paragon Gear Works, of Taunton, Mass., has been especially busy during the past year, and while it nearly doubled its output by the erection of a new plant last spring, this increase in its facilities has proven inadequate, and it was found necessary recently to install new machinery. From now on the company will be able to make prompt deliveries on its gears, which are manufactured in several different models, ranging from the enclosed type reverse gear for pleasure boats to the extra-heavy-duty model used on motors of the Diesel type. The gear shown in the illustration on page 55 is known as the yoke-operating type. This gear is designed especially for engine builders who extend their beds to accommodate it, and it has already made a place for itself as a part of the regular equipment on many of the high-grade motors. A feature of this gear is the absence of any lower link, while another is the system of ingenious stop links that securely lock the gear in either position. The operating lever may be placed on either the port or the starboard side. This gear is made in ten different models for transmitting anywhere from 1 to 100 h.p. The Paragon line is so complete that from it a gear may be selected to fill every requirement of motor boat practice.

Manzel Oil Pumps

The Manzel Bros. Co., of Buffalo, N. Y., is marketing its Class C oiler, which has been designed to give positive lubrication under all conditions of service. This oiler consists of a series of individual pumping units placed in a reservoir. Each pump unit is composed of a double plunger pump—one plunger drawing the oil from the reservoir and forcing it to the sump glass and the other taking it from the glass and impelling it to the cylinders or other parts requiring lubrication. Each feed can be adjusted to supply the exact amount of oil required, regardless of the amount the other units are supplying. Manzel oilers will handle heavy or light oil, and are arranged to pump against any pressure required. They may be run in either direction and at any speed, while the feeds can be adjusted to supply as little or as much oil as is needed. Any number of feeds can be furnished, and the drives may be by pulley or ratchet, and can be located at either end, front, back or through the bottom, as desired.

Wilco Specialties

Two of the newest articles in the line of marine specialties carried by E. J. Willis Co., of N. Y. City, are the Giant and the Wilco Jr. electric stern lights. The Wilco Jr. light, which is shown in an illustration on page 55, is intended for use on canoes and small runabouts, and is an ornament as well as a necessity. The Giant may be used on the more pretentious craft in Class I and also on Class 2 boats. Complete with a four-foot pole, it sells for \$4.50, while the smaller outfit is listed at \$3.45. Both lights may be run from magneto, dry cells or storage batteries.

A favorite item in the Wilco line is an exhaust cover or deck ventilator. This is a highly polished brass fitting designed for use over the exhaust connection on the side of the boat. Its purpose is to prevent the gases from being wafted inboard, but it may also be used as a ventilator on the deck or hatch covers for ventilating the engine compartments. Although regularly supplied in brass, it may also be furnished in aluminum on special order.

Shipmate Ranges

The Shipmate range is, of course, known wherever motor boats are used, and its position in the maritime world is unique. So far as we are aware, no other concern manufactures vessel ranges in anything approaching the number of Shipmates made and sold each year, while it is said that there is no other line of ship stoves which is comparable to the Shipmate line. This line is so complete that it is difficult to conceive of a craft large enough to carry a range for which there is not a suitable Shipmate, or to find a situation so peculiar that there is no Shipmate for it. Exception to this statement may be taken in the case of large vessels carrying a great number of passengers which require specially constructed ranges.

The smallest Shipmate weighs less than 100 pounds, and has an oven nine inches square. From this size the line moves up in very gradual steps, with slight differences in the ten sizes. With such a complete

(Continued on page 82)

Yard and Shop

Thorobred Boat in War Service

One of the accompanying illustrations shows the pilot boat of the harbor master at Gibraltar, Spain. This boat is a 37-footer, powered with a Model F Thorobred Red Wing motor, and she has been called upon to perform extraordinary duty since the commencement of the war. Her work is extremely hazardous, as she is required to pilot big ships in and out of Gibraltar harbor, threading her way through the defensive mine fields. Of 10-foot beam and heavy construction, she yet maintains a speed of 9 m.p.h., which is exceedingly good. Her motor was ordered from the Red Wing Motor Co., of Red Wing, Minn., by Joseph Bado, of the Motor Car Works, Gibraltar, and was the second machine bought by him from this concern.

Toppan Leases Larger Store

The Toppan Boat Mfg. Co., of Boston, Mass., has just announced the lease of a much larger store and office in the Trade Bldg., 87 Washington St., N. E., near Haymarket Sq. A representative line of Toppan rowboats, sailing dories and motor boats will be kept on display, as well as a line of Universal and Kermath four-cycle motors. In addition there will be some of the latest types of detachable motors on view, and an assortment of high-grade motor boat fittings. The Toppan company extends a cordial invitation to motor boatmen to make this store their headquarters when in Boston, whether or not they intend to purchase Toppan goods.

Boston Varnish Co. Expands

The Boston Varnish Co., of Boston, Mass., has forty men working on its new 55 x 115-foot four-story factory building, and is also putting up a new two-story building for housing its office and advertising departments. These buildings are of mill construction and

to tow the four life-boats with twenty-one men aboard to a place of safety. This was valiantly done, and credit for saving the lives of the party is given to the reliable Scripps power plant.

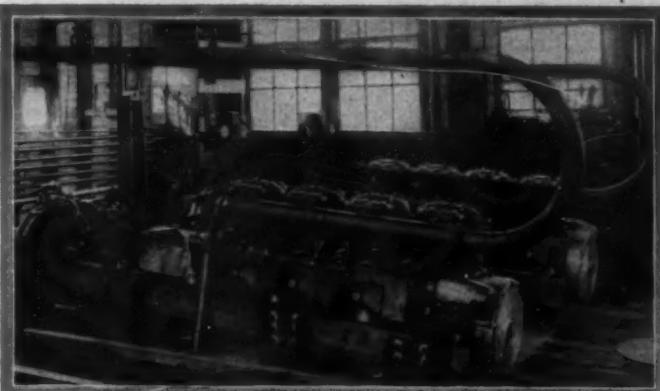
Testing the Model F's

Occasionally a motor installation calls for forward drive with the engine mounted in the boat the opposite of the usual way. The accompanying illustration depicts the testing out of a pair of Sterling Model F eightes, and is an indication of the thorough methods employed by the Sterling Engine Co. As will be noticed, the exhaust openings are at the forward end of the engines instead of aft. Another noticeable circumstance is the mounting of the motors at an angle; this is done in order to give the oiling system a thorough test. The Sterling way of testing allows no small troubles to develop subsequently, because the engines are given their trials under as close a duplication as can be attained.

Tinker Belle

One of the illustrations on this page is of Tinker Belle, a neat little Hand V-bottom 28-foot outfit which is powered

the plant is compact and neat and fits nicely into a corner of the engine-room. This direct-connected set furnishes current not only for lighting the boat, but for operating the 100 c.p. nitrogen bulb searchlight and for the ignition of the engine. The plant weighs about 325 pounds and is 30 inches high without the base. As installed, it is equipped with a Maxim silencer, and the gasoline tank is placed at the side horizontally so that the rolling of the boat will not interfere with the fuel supply. The system is a 32-volt one and will carry thirty-two 16 c.p. lights continuously. It operates, of course, in conjunction



Testing two Sterling eightes which are to be installed in a boat the opposite of the usual position. Note that the motors are mounted at an angle in order to give the oiling systems a thorough tryout under working conditions



Mohawk, a 61-foot work boat which is in daily use on a Washington lake, transporting passengers, mail and freight. Her high-speed six-cylinder Van Blerck does the work day in and day out without the slightest whimper

are of the latest type of construction throughout. These new edifices together with the new battery of ten melting fires just completed will make it possible for the concern to keep up with present orders and double its output during the coming season.

Scripps Saved Great Bear Survivors

When the Arctic schooner Great Bear, built for scientific research at a cost of \$63,000 for John Borden, of Chicago, tore a hole in her hull in the Bering Sea, there was a Scripps motor on hand to come to the rescue of the imperilled lives of the ship's company. Captain Louis Lane, who was in charge of Great Bear when she ran aground on Pinnacle Rock, took a hurried look at the damage done and decided that there was no hope of saving the schooner. All hands, therefore, piled into the lifeboats and at 3:30 of a none-too-warm morning the party left the wreck, well supplied with food, clothes and ammunition. In Great Bear's small-boat equipment was a Scripps-powered lifeboat, and it fell to the lot of this motor

with an Anderson engine. The power plant is a three-cylinder job with four-inch bore and stroke, and it gives a speed of 9 m.p.h. As the boat is heavily constructed and is quite beamy, this speed is considered eloquent testimony to the worth of both boat and motor. Concerning the latter, the owner, L. H. Collins, who runs it on the Maroochey River, Queensland, Australia, has written the makers: "I have had



A 37-foot pilot boat in use in the harbor of Gibraltar. She is powered with a Model F Thorobred, and is employed in guiding big ships through the mine fields



A neat little Hand 28-footer from Australia. Tinker Belle, as she is called, is powered with a three-cylinder 7 1/2 h.p. Anderson which gives her a 9-mile speed

this engine now for over three years and haven't had one moment's trouble with it."

Delco-Light Boat Equipment

We take pleasure in showing on the next page a photographic reproduction of the auxiliary power installation in Spray II, the new motor yacht owned by Henry B. Joy, of Detroit, Mich. Spray is a 65-footer used for cruising on the Great Lakes, and the advantages of unlimited electric light appealing to the owner, he had the Delco-Light electric lighting plant installed last summer. As may be seen, the

with a storage battery, although it will run the lights direct without flicker.

A Van Blerck Work Boat

An example of the efficiency of the Van Blerck motor in commercial service may be found in the case of the 61-foot Mohawk, owned by the Lake Chelan Transportation Co., of Lakeside, Wash., and in daily service on Lake Chelan. The motor is a six-cylinder machine turning a three-bladed 26 x 24-inch Coolidge at a rate of 700 r.p.m., and it gives a boat speed of 12 1/2 m.p.h. The boat is used daily throughout the year, as she carries U. S. mail in addition to freight and passengers. She comes in for some hard wear, as there are very few wharves along the route, most landings being made by shoving the boat's nose up into the bank and unloading over the bow. This means that the reversing mechanism must be on the job at all times, and, according to the owners, it is. The Van Blerck power plant weighs only 1,800 pounds and occupies a space only eighty-one inches long by twenty-one



Attractive window display recently set up by the H. & N. Carburetor Co., of New York

inches high. It is stated to be economical in its use of fuel and oil compared with heavy, slow-turning motors in general use for work of this type.

A Trim Gray 27-Footer

Among the motor boat enthusiasts in the United States who find their best sport in Canadian waters is Dr. Charles L. Hamilton, of Dwight, Ill. Kawartha Lake, Ont., is his favored retreat, and there he has in commission an attractive 27-foot Peterborough runabout which is powered with a Model D four-cycle 20-24 h.p. Gray motor. With this efficient power plant, Artie G. 2nd, as she is called, is able to reel off the



C. J. Pope, new sales manager of the Universal Motor Co., hard at work at his desk

distance at a 16-mile rate, and this is considered some going, as the boat was constructed for family purposes and is not an out-and-out speeder. Dr. Hamilton reports great satisfaction with both hull and engine, and has complimented the Peterborough Canoe Co., who are the Gray agents in the locality, on the general excellence of the outfit. He says that he is more than pleased with the power plant, as with it he is enabled to travel slowly enough for trolling or rapidly enough for his other needs. The boat is illustrated on page 39.

Wagner-Hoyt Electric Co. Organized

A new company, styled the Wagner-Hoyt Electric Co., of New York City, has been organized for the purpose of supplying for engine and boat manufacturers and owners complete electrical equipment which shall consist mainly of electric starting motors and generators, storage batteries, high tension magneto and incidental equipment. The company owns and has pending many valuable patents and a license in the patents of the Ward Leonard Electric Co. to manufacture and sell its lighting systems. Incorporated for \$1,000,000, it has absorbed the business of the Wagner Specialty Co., of New York, which was the exclusive service representative of the Ward Leonard electric system, and which had control of 800 service stations throughout the country. The personnel of the new corporation includes A. F. Wagner, founder and owner of the Wagner Specialty Co. as president and general manager, and Francis R. Hoyt, treasurer and chief engineer. Mr. Hoyt was formerly chief engineer of the Simms Magneto Co., and is an inventor whose entire career has been spent in the electrical field.

New Bosch Manager for Frisco Branch

The Bosch Magneto Co., of New York, N. Y., has announced the resignation of B. R. Miller, manager of the San Francisco branch, and the appointment of Lee C. Carlton to fill the vacancy. Mr. Carlton, who has been in the engineering department of the main office in New York, will assume his new duties immediately.



When the schooner Great Bear went on Pinnacle Rock in the Bering Sea and was destroyed there was a Scripps-powered lifeboat in the small-boat equipment which took hold and saved the lives of the crew.

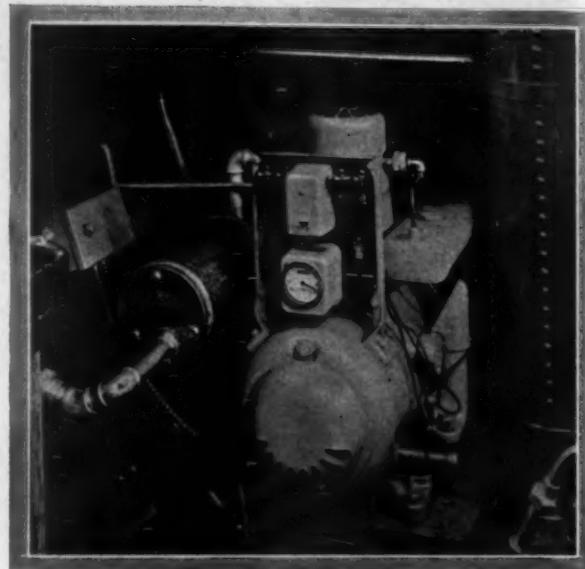
New Enclosed Sterling for Runabouts

The Sterling Engine Co., of Buffalo, N. Y., advises us that it will have ready for delivery on or about the 1st of December an entirely enclosed motor for runabouts and small cruisers. The machine has a conservative rating of 17 h.p. at 600 r.p.m., 25 h.p. at 1,000 r.p.m. and 30 h.p. at 1,200 r.p.m. Like

the celebrated Model F Sterling it has the pressure feed oiling system through the crankshaft and numerous other valuable features found only in engines of advanced design and construction. The machine is known as the Model E2 17-25 h.p. and supersedes the Model E1 17-25 h.p. engine.

Carlstrom Used Splitdorf Plugs

When Victor Carlstrom made his recent successful trip from Chicago to New York in the New York Times Curtiss biplane, his engine was equipped with sixteen Splitdorf plugs. Mr. Carlstrom planned to make the city-to-city flight a non-stop record, but trouble with his fuel line forced him to descend at Erie, Pa., after which he flew to



The installation of the compact Delco-Light lighting outfit in an engine-room corner of Spray II, Henry B. Joy's cruiser



A two-engine runabout which exemplifies a new idea in powering runabouts. In place of one large motor it is equipped with two 24 h.p. Grays.

Hammondsport, N. Y., where he spent the night, arriving in New York City early the next morning. No trouble developed with his spark plugs, however, and for nearly eight and a half hours' actual flying time the green-jacketed Splitdorfs carried the sparks to the combustion chambers with never-failing regularity.

Camden Anchor Enjoys Busy Year

The past season has been a very busy one with the Camden Anchor-Rockland Machine Co., of Camden, Me., and has

Personalities

Marine Field Loses Wadman

Rex Wadman, who has been associated with one prominent company or another in the marine field for the last five years, and who has been the advertising manager of the Van Blerck Motor Co., of Monroe, Mich., since early in 1915, resigned from his position with that company on November 1 to become a member of the Campbell-Ewald Co., of Detroit, Mich. This firm conducts an advertising service which is nationally known, and as part of his new duties Mr. Wadman will continue to handle the advertising and publicity of the Van Blerck Co. It would not be stretching the truth to say that Mr. Wadman has played an important part in the growth of the marine engine industry during the time that he has been connected with it, for he has had a voice in the shaping of the affairs of the Van Blerck concern, and this is one of the leading engine manufacturers at the present time.

John L. Hacker Working Hard on His Own

John L. Hacker, who recently severed his connection with the Albany Boat Corp., and moved to Detroit to resume the designing of motor craft on his own hook, is driving away at it with all the energy that there is in him, and has already placed a number of designs for different types of boats. Mr. Hacker is known to the marine field as the designer of the famous Kitty Hawk, the Oregon Kids, Hawk Eye and other top-speed racers. Until this year Hawk Eye was considered the fastest single-step hydroplane in the country, and she is still among the very few when it comes to churning the miles behind her.

New Universal Sales Manager

Owing to the phenomenal growth of the business of the Universal Motor Co., of Oshkosh, Wis., it became necessary to increase the facilities of the concern for sales handling. This need resulted in the appointment of C. J. Pope, whose work-a-day portrait is shown on this page to the position of sales manager. Mr. Pope will handle the sales and take care of every individual inquiry, supervise the agencies, watch their territory to prevent conflict of sales and otherwise further the service of the famous 9-12 h.p. Universal motor.



Rex W. Waldman of the Campbell-Ewald Co., advertising agents



R. B. Burnham, advertising manager of the Gray Motor Co.



A. J. Mitchell, who now manages the advertising of the Sterling Engine Co.

kept both its boat and its engine departments operating at top speed. One of the contracts recently completed consisted of five motor surf boats for the U. S. Coast Guard. These boats were built from the U. S. C. G. design known as the Beebe-McLellan self-bailing surf boat, and are 25 feet 4 inches over all by 7 feet beam.

The boats are well known throughout the country, as the Government has hundreds of them in service at its different Coast Guard stations.

The five boats built by the Camden people differ from the ordinary run in that they are powered with vertical instead of horizontal motors. The engines fitted are two-cylinder two-cycle 6 h.p. Knox machines, manufactured by the same concern, and two of them, right and left, are fitted to each boat. Each motor is installed with a reverse gear self-contained in the base of the motor, and they are placed in a watertight compartment. They are started by means of hand starters on the forward compartment. Duplex mag-throttle and re-handled by end of the operator has the at all times a sealed. The Coast Guard

operated by cranks end of the engine. Ignition is by Bosch neton and the spark, reverse controls are levers at the after compartment so that the boat under control when the compartment. These craft, like all surf boats, are self-



The Jacobson semi-Diesel oil engine which is constructed for continuous twenty-four-hour service

bailing and are easily righted by means of righting lines attached to the gunwale. The decks are planked with cedar, and the frames are of white oak, while the fastenings are of copper and the hardware of extra heavy bronze of Government mixture. Water-tight compartments are fitted fore and aft, and also to enclose the engine compartment. Not only were the boats and engines built by the Camden Anchor-Rockland Machine Co., but all the special bronze fittings were cast in the plant of this concern's Rockland plant.

Holt-Welles Co. Elects

At the recent annual stockholders' meeting of the Holt-Welles Co., Inc., of New York City, the following officers were elected for the ensuing year: E. H. Stickels, president; F. E. Hamilton, vice-president and counsel; Calvert Holt, treasurer; Paul Welles, secretary, and William M. WeWilliams, assistant treasurer and secretary. The board of directors, composed of the above officers, was also elected for one year.

Don't Make Any Engagements for January 27-February 3 That You Can't Break! It's Motor Boat Show Week at the Palace.



Dr. Charles L. Hamilton, of Dwight, Ill., is one of those Americans who are partial to Canadian waters. His Artie G II, which is powered with a 20-24 h.p. Gray motor, has been instrumental in giving the doctor a wide knowledge of the cruising grounds adjacent to his summer home in Ontario

Sverre Nilsen, of Norway

Mr. Nilsen, who hails from Christiania, Norway, has been in this country for the last several weeks for the purpose of looking over the marine field and of assuring himself of the probabilities of importing into Norway large quantities of American marine motors during the coming season. Mr. Nilsen called at the offices of this magazine, and in the course of our conversation with him, revealed himself as a firm believer in the general excellence of the motors manufactured in this country. In Norway, according to him, there is practically no local competition for high-speed motors, as the Norwegian engine manufacturers confine themselves almost exclusively to slow-turning, heavy-duty machines of the hot bulb type.

Mr. Nilsen was a guest at the plant of the Universal Motor Co., of Oshkosh, Wis., for several days, and the company informs us that its members feel highly gratified in having a representative of his ability and personality. He is the exclusive agent of that company in Norway and has already sold large numbers of Universal marine motors and electric lighting sets.

In addition to the Universal agency Mr. Nilsen also handles the Van Blerck and the Waukesha lines of marine motors.

Doris IV, Fast Displacement Runabout

R. J. Tooke, of Montreal, Quebec, is the owner of the 35-foot Doris IV, which is one of the fastest displacement boats in the world. She is a concave, V-bottomed runabout of Crouch design and is powered with the famous Model R 250 h.p. Sterling racing motor.

Doris IV is a big, bushy, comfortable craft with a carrying capacity of



A Sterling-powered 35-foot runabout owned by Joseph Leyare of Ogdensburg, N. Y. If the occupants of the craft object to its high speed, there's not a man in the after cockpit who'd dare voice his protest

Some Twin-Screw Discoveries

The idea of the twin-screw installations for small cruisers and runabouts is a novel one. To many it seems like unnecessary complication, double engine-room space, increased cost, fuel consumption, vibration, etc. As a matter of fact, however, none of these commonly accepted ideas are necessarily true; in fact, all of them have recently been disproved by a series of experiments conducted by the Gray Motor Company.

The runabout shown in an illustration on page 58 is 30 feet over all and has a beam of 5 feet 6 inches. The average designer would recommend a single high-speed engine of from 40 to 50 h.p. which he would predict should give the outfit a speed of 17 to 18 m.p.h. Such an engine as this was, in fact, originally installed—six-cylinder high-speed type of motor which developed 50 h.p.

The six-cylinder motor was then removed and two Model D 20-24 h.p. four-cycle Gray engines were installed as shown in the detailed photograph. The two



Here is one of the fastest displacement boats on this planet. She has a top speed of 42½ m.p.h. and her 250-h.p. Sterling accepts full responsibility for this rate of travel. The boat's name is Doris IV

have been notable in their time. The first one was equipped with two six-cylinder machines and the other two with the famous Sterling racing eight.

motors did not bring the boat down any deeper in the water, for both together actually weighed less than the six-cylinder engine. They did not take up eight.

Club Note
Ambrose Channel Y. C. Dinner

The Ambrose Channel Y. C. celebrated its fifth anniversary recently by giving a dinner to its members and friends at the clubhouse, foot of Bay Twenty-second St., Bath Beach. The affair was a very elaborate one and was enjoyed by nearly 300 persons.

Commodore Emil Steffens and his officers deserve great credit for selecting such able committees as were in force in 1916, and who made not only this dinner, but the other functions of the year uniform successes. The aggressiveness of the Commodore and his official staff has been the means of making the A. C. Y. C. one of the most highly thought of clubs on Gravesend Bay.

While the guests were enjoying the dinner, the newest Benedict of the club, William Shields, owner of Blanchwood, entertained with a number of vocal selections. William is a considerable vocalist, and what time the plates weren't rattling to the reverberations of his voice, the guests were keeping up the volume of sound with hearty applause.



This is the little racing boat owned by Cliff S. Hadley, of Ozone Park, L. I., which won so many races in that vicinity last summer. A Roberts motor gives it life and go

MOTOR BOATING ADVERTISING INDEX

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Valspar Motor Boat—Owner, William Olson

How a Practical Boat Owner Uses Valspar

The letter on this page tells how another practical boat owner has obtained perfect satisfaction from the use of Valspar.

This man knows something about marine paints and varnishes. His advice, if followed, will save you time, trouble and expense.

608 N. 10th St., LaCrosse, Wis., Feb. 5, 1916.
VALENTINE & CO.,
 Gentlemen: To sum up my experience during the last six years, with your products and with others, I will merely say—I am satisfied and with Valspar exclusively from now on.
 A little of the following advice might do some good:
 Do not try to make one coat do, just because the deck or hull looks "shiny." Use two or three coats, and it will continue to shine all through the season.
 Go after the entire boat several times during the season with Ivory Soap and a stiff brush, and the hull will always have a fresh appearance.
 Remember these few hints and your boat will look better at the end of the season than inferior finished boats will at the end of the first few weeks in the water.
 From what I have seen in my experience, a deck finished in Valspar Gloss white, or Valspar varnish, over natural wood, will out-wear any "painted" deck, and certainly looks much nicer.
 Yours very truly,
 WM. OLSON.

Such men of experience are almost invariably Valspar "rooters" because their knowledge is comprehensive, analytical. They are on the watch for the best in every line. That's why so many of them use Valspar, the varnish that keeps boats spick and span, that won't turn white, that is tough and durable.



How about your boat? Can you truthfully say you have had as good results from your bright work as Mr. Olson has? You will have if you use Valspar.

VALENTINE & COMPANY
 456 Fourth Avenue New York City

Largest Manufacturers of High-grade Varnishes in the world

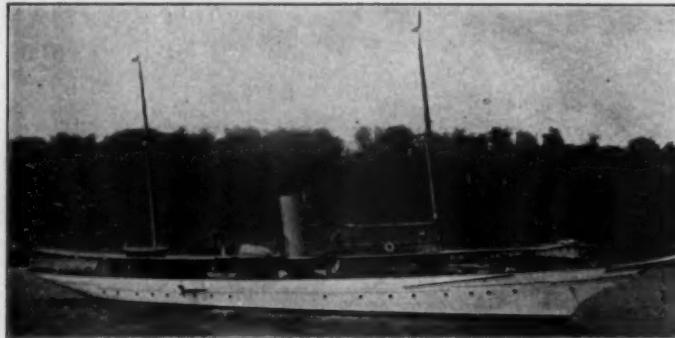
New York	Trade	VALENTINE'S	Mark	Toronto
Chicago				London
Boston		Established 1832		Amsterdam
W. P. FULLER & CO., Agents for Pacific Coast				
San Francisco	Los Angeles	Sacramento	Oakland	Long Beach
Stockton	San Diego	Pasadena	Seattle	Tacoma
Santa Monica	Portland	Spokane	Boise	

Naval Architects
and
Yacht Brokers.

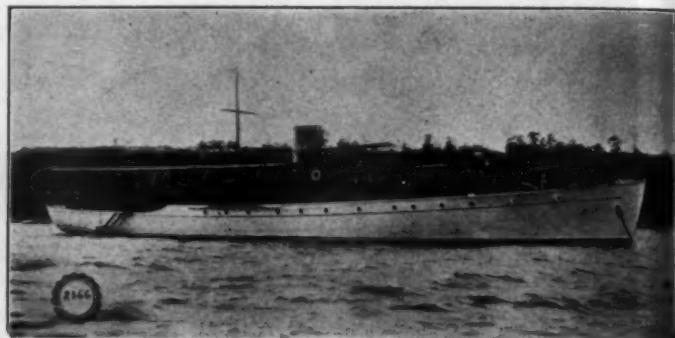
COX & STEVENS

15 William St., New York
Telephone—1375 Broad
Cable—BROKERAGE

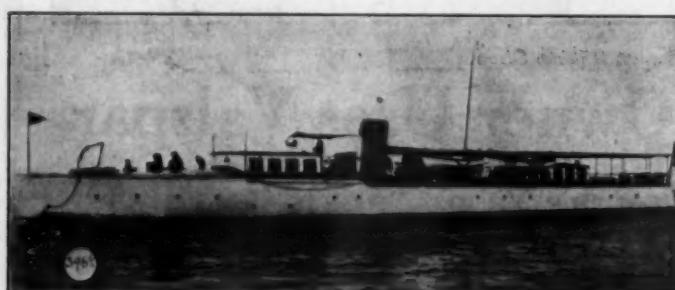
We have a complete list of all steam and power yachts, auxiliaries and houseboats available FOR SALE and CHARTER. A few are shown on this page. Plans, photographs and full particulars furnished on request. Catalogue illustrating types and sizes of yachts we have for sale will be mailed on application.



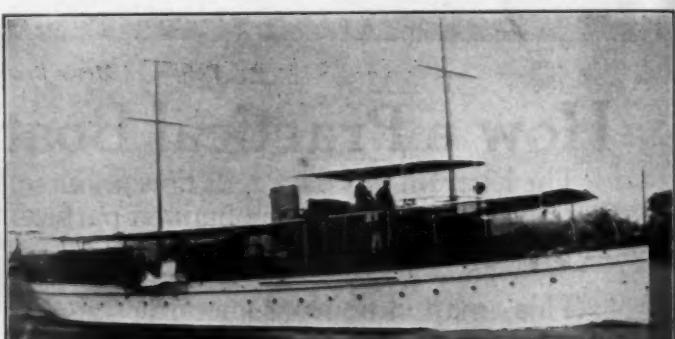
No. 229—For Sale—Fast, twin screw, steel steam yacht, 155 x 18 x 7.6 ft. Speed up to 18 miles. Dining saloon and social hall on deck. Five staterooms, two bathrooms, etc., aft. Handsomely finished and furnished. Cox & Stevens, 15 William Street, New York.



No. 2366—For Sale—Most desirable cruising power yacht of large size available; 126 x 18.6 x 6 ft. Steel construction. Speed 11-13 miles. Large dining saloon on deck; five staterooms, two bathrooms, main saloon, etc., aft. All conveniences. Cox & Stevens, 15 William St., New York.



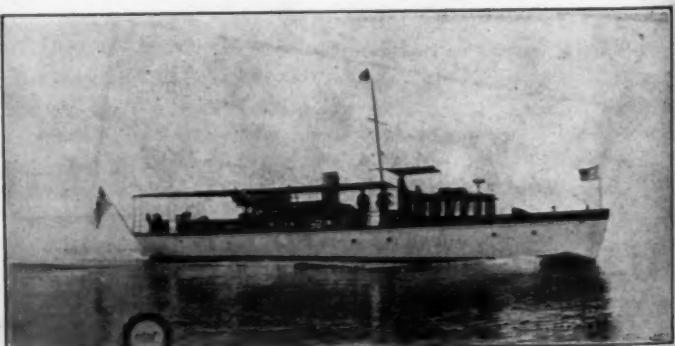
No. 396—For Sale—Especially desirable modern, fast, steel steam yacht (oil burning) with excellent cruising accommodation. Speed up to 18 miles. Accommodations include dining saloon on deck forward; large owner's stateroom, with dressing room, main saloon, three single staterooms and two bathrooms aft. In excellent condition. Attractive figure will be accepted for prompt disposal. For further particulars apply to Cox & Stevens, 15 William Street, New York. Telephone 1375 Broad.



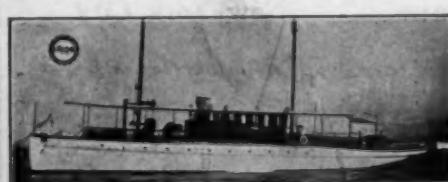
No. 1796—For Sale or Charter—Very roomy, twin-screw cruising power yacht, 99 x 17 x 4 ft. Speed 13-15 miles; Standard motor. Large dining saloon, six staterooms, three bathrooms; all conveniences. Cox & Stevens, 15 William St., New York.



No. 2531—Exceptional Bargain—Most desirable 65 ft. waterline flush deck, keel auxiliary available. Speed under power 7½ miles; 55 H.P. Sterling motor, Independent electric light plant, Ratsey sails, and complete equipment, all new 1915. Two double, one single stateroom, two bathrooms, large saloon, etc. Special opportunity. Cox & Stevens, 15 William Street, New York.



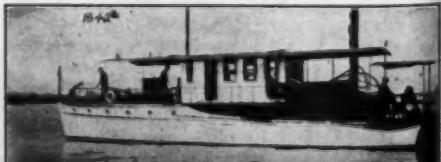
No. 1828—For Sale or Charter—Attractive power yacht; 75 x 13 x 3.6 ft. Speed 11-12 miles; Standard motor. Dining saloon, two double and one single stateroom, bath, two toilets; all conveniences. Cox & Stevens, 15 William Street, New York.



No. 1503—For Sale at Low Figure—Flush deck cruising power yacht; 85 x 15.6 x 4 ft. Speed 12-13 miles; 75/90 H.P. 6 cyl. Standard motor. Large deck saloon, two double staterooms, main saloon, bath, two toilets, etc. Cox & Stevens, 15 William Street, New York.



No. 2022—For Sale—Modern bridge deck cruiser, 55 x 12 x 4 ft.; 6 cylinder, 65 H.P. Sterling motor, new 1916; speed 12 miles. Double stateroom, large saloon, bath and toilet room, etc. Interior finish, African mahogany. Large bridge and after deck. Cox & Stevens, 15 William St., New York.



No. 1342—For Sale or Charter—Roomy gasoline cruiser of houseboat type; 60 x 12.8 x 3 ft. draught. Speed 11 miles; 50/50 H.P. 20th Century motor, new 1915. Saloon with two Pullman berths, three staterooms, bath, 2 toilets, etc. Also deckhouse containing dining saloon. Cox & Stevens, 15 William Street, New York.

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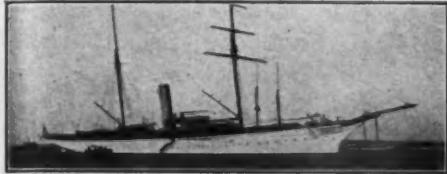
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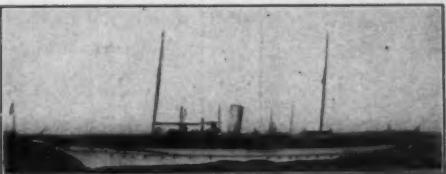
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7840—An excellent chance to purchase 155-foot Steel Twin Screw fast Cruiser. Speed up to 18 miles. Low price. Stanley Seaman, 220 Broadway, New York.



5233—Here is a very fine 113-foot Steam Yacht that cost \$60,000, and can be purchased for less than one third. Maintained at about half cost of gasoline yacht same size. Stanley Seaman, 220 Broadway, New York.



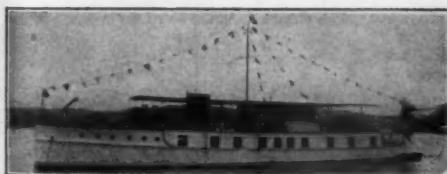
8420—125-foot Steel Twin Screw Seagoing Cruiser with 3 staterooms and 2 baths. Speed 15 miles. Stanley Seaman, 220 Broadway, New York.



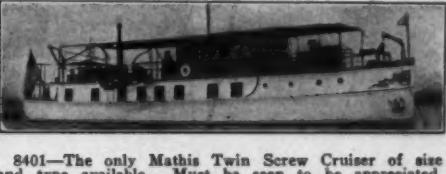
8378—The finest 112-foot Twin Screw Lawley Seagoing Cruiser available. Speed 14 knots. Low price. Stanley Seaman, 220 Broadway, New York.



8448—Lawley Twin Screw Steel Seagoing Cruiser. 110 ft. long. Fine accommodations and conveniences. Stanley Seaman, 220 Broadway, New York.



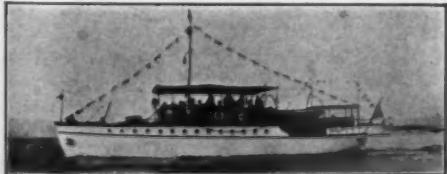
8457—For Charter—95-foot Twin Screw Shoal Draught Cruiser. Ideal for Florida use. Stanley Seaman, 220 Broadway, New York.



8401—The only Mathis Twin Screw Cruiser of size and type available. Must be seen to be appreciated. Stanley Seaman, 220 Broadway, New York.



8362—Here is the best 62-foot House Boat for Sale or Charter. Now in Florida. Stanley Seaman, 220 Broadway, New York.



8496—57-foot Cruiser with house boat accommodations. 3 staterooms, bath. In commission Miami, Fla. Stanley Seaman, 220 Broadway, New York.



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8429—50-foot Matthews Cruiser. New 1914. New 60 Sterling engine 1916. Offer solicited. Stanley Seaman, 220 Broadway, New York.



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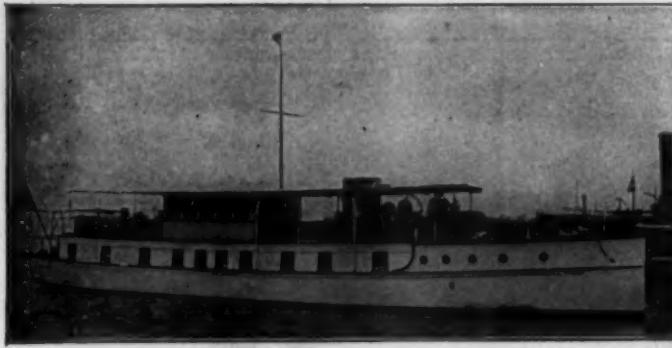
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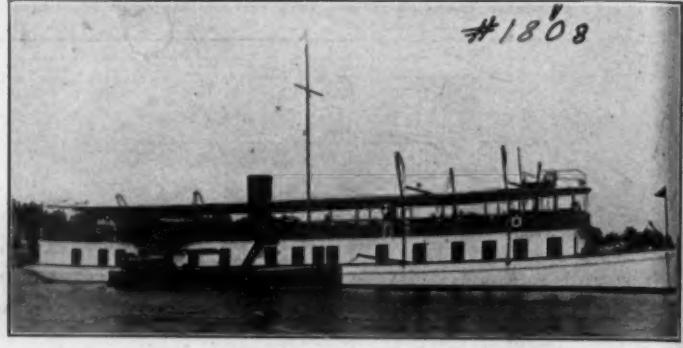
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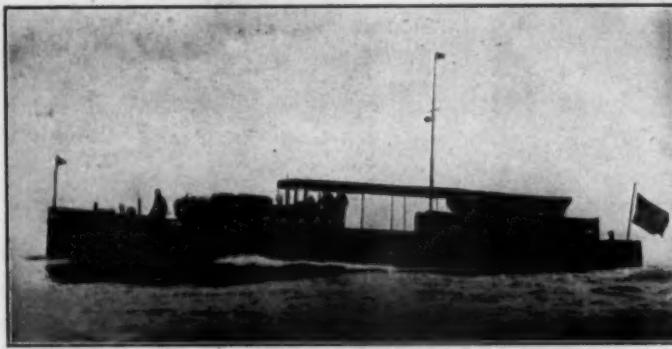
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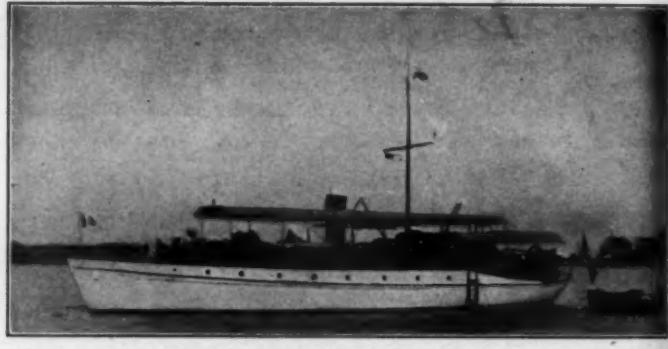
No. 1871—Sale—Charter—Modern motor houseboat. 95 ft. x 19 ft. x 3.3 draft. 4 staterooms, dining saloon, social hall, etc.



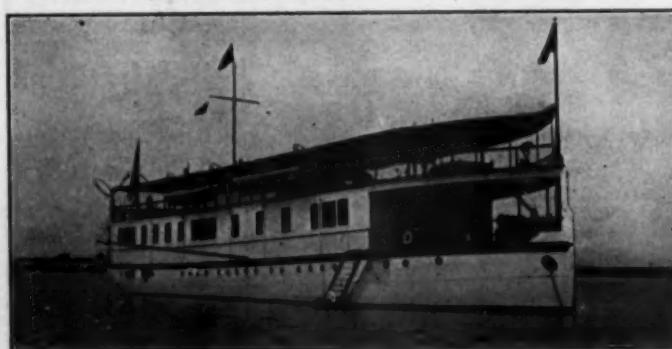
No. 1808—Sale—Charter—Twin Screw Houseboat, admirably suited for Southern waters, 125 ft. x 17 ft. 8 in. x 3 ft. 4 in. draft. 4 Large staterooms, 2 bathrooms, saloon, etc.



No. 7099—For Sale—Most desirable twin screw day cruiser available, 67 ft. 10 in. x 12 ft. x 3 ft. 9 in. draft. Designed by us; built 1911. Two 20th Century motors. Speed up to 14 miles. Very large cockpit.



No. 7674—Sale—Charter—Modern twin screw motor yacht 75 ft. x 17 ft. 6 in. x 3 ft. 8 in. draft—20th Century motors. Speed, 12 miles. One double and one single stateroom and very large main saloon.



No. 1805—Available for Winter Charter—Modern twin screw, 125 ft. houseboat. 8 Large staterooms, 3 bathrooms, and 3 saloons.



No. 1860—Sale—Charter—Desirable Houseboat, 70 ft. x 18 ft. 6 in. x 18 in. draft. 2 35 H.P. Sterling motors new 1915. 3 double staterooms, saloon, deckhouse and bathroom.



No. 1847—Sale—Charter—Shallow draft houseboat, 65 ft. x 18 ft. x 28 in. 4 staterooms, large main saloon and bathroom.



No. 1912—Charter—Modern Houseboat, 64 ft. x 17 ft. 6 in. x 3 ft. 2 in. draft. 3 staterooms, main saloon, sitting room on deck, bathroom, etc. Standard motor.

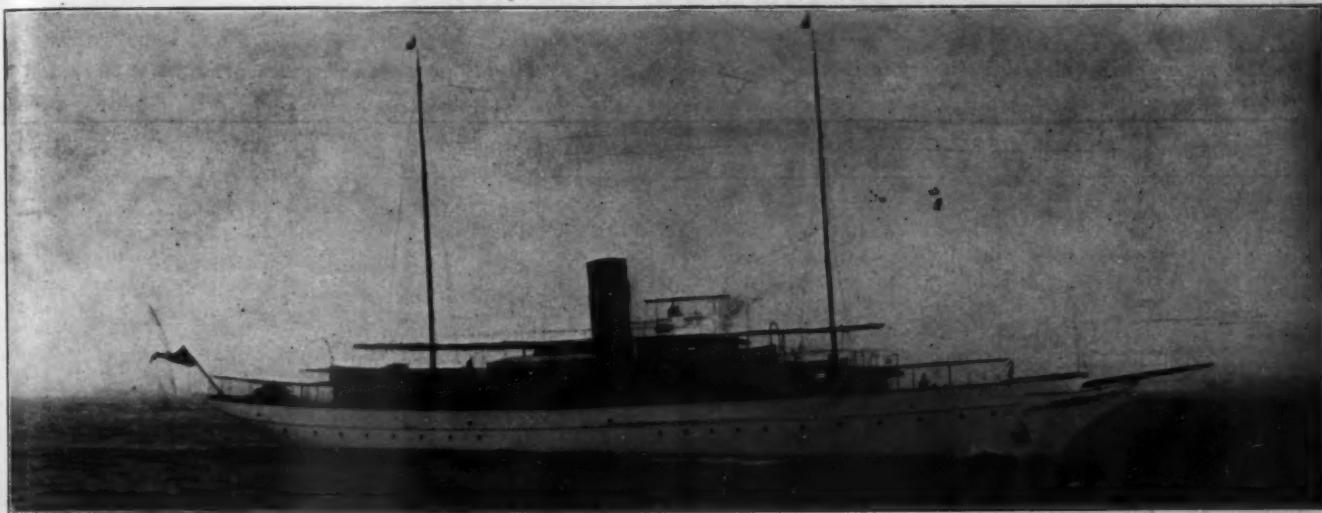
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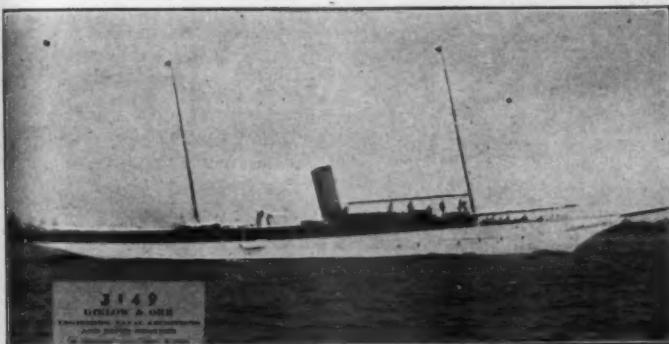
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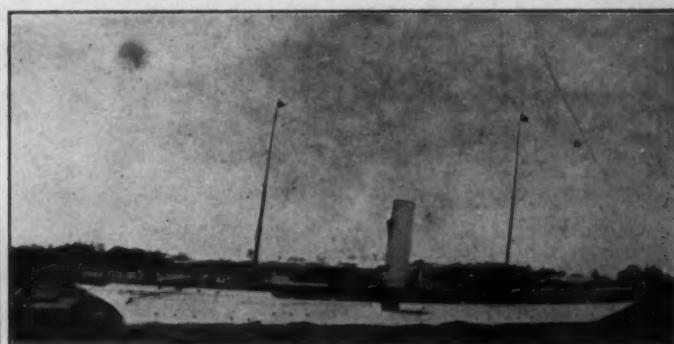
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No. 5113—For Sale—207-foot twin screw steel steam yacht. Oil fuel. Yacht embodies every modern convenience. Has made several foreign cruises.



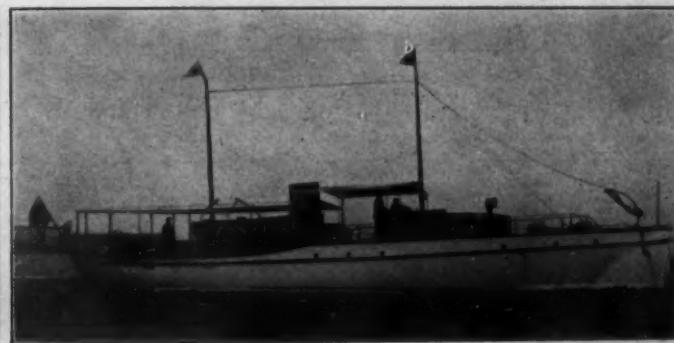
No. 3149—For Sale—Handsome 210-foot steel steam yacht. Seven staterooms, two baths, dining saloon and social hall.



No. 2968—For Sale—Handsome ocean-going steel steam yacht, 214-foot. Eight staterooms, three baths, main saloon, dining room and library.



No. 4591—For Sale—126-foot twin screw steel motor yacht. Five staterooms, dining and main saloon, two baths. Is without a doubt the most desirable cruising yacht of its size afloat.



No. 5213—Offered by estate. Practically new 80-foot Lawley motor yacht, two double staterooms, bath, dining saloon, hot water heating system. Deck and engine room controls.



No. 5592—For Sale—attractive price—50-foot twin screw motor yacht. Large saloon, accommodations for four. Deck control. Have sold owner larger yacht.



No. 5576—For Sale—48-foot motor yacht. One double stateroom. Speed up to 13 miles. Large bridge deck.



No. 5088—For Sale—50-foot cruising power yacht. Two double staterooms, copper screened throughout. Bridge control.

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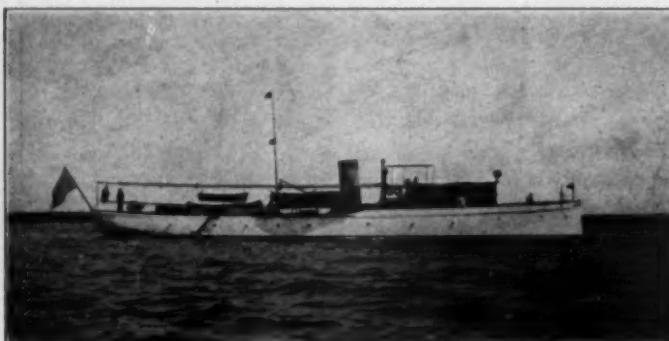
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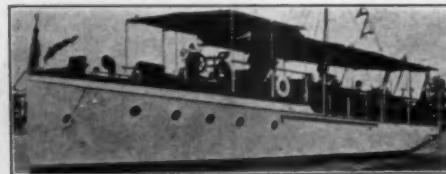
No. 1388—Twin Screw Power Yacht, 112 x 15.6, best construction and equipment; Craig motors; large accommodations; new after deck house.



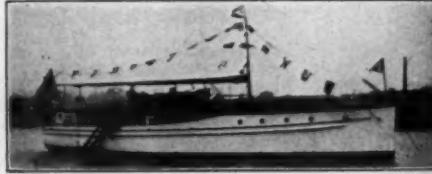
No. 2112—Modern cruiser 80 x 13.6; two six cylinder Sterlings; good interior arrangement; used only two seasons.



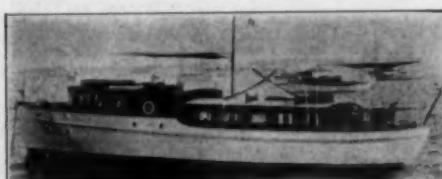
No. 1960—Desirable cruiser, 65 x 12; best condition; complete outfit; 60-80 H.P. motor; price reasonable.



No. 1880—Able Cruiser, 60 x 12, built 1913, new 6-cylinder motor, bridge control. Good accommodation.



No. 1837—Staunch Cruiser, twin screw, 50 x 13, light draft, Standard motors. In commission.



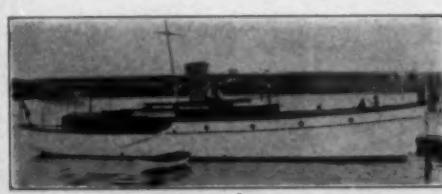
No. 1810—Attractive cruiser, 51 x 11, recent build; Murray & Tregurtha motor; price reasonable.



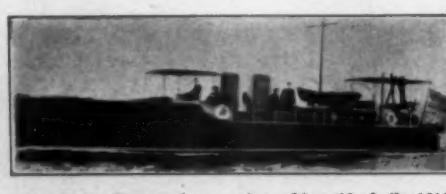
No. 1927—Ideal cruiser, recent build, 65 x 13 x 3.6, six-cylinder Twentieth Century motor, first-class condition.



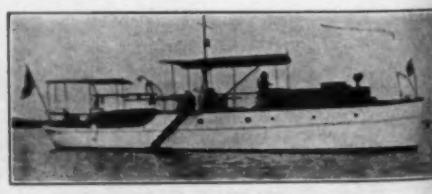
No. 64-H—Florida Houseboat, 62 x 17, light draft, tunnel stern, 50 H.P. motor, large accommodations.



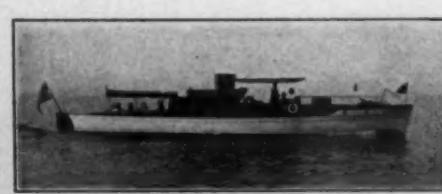
No. 1971—Bridge deck cruiser, 55 x 12, Sterling motor 65 H.P.; new 1916; double stateroom, bath, saloon, etc.



No. 2131—Fast modern cruiser, 56 x 11, built 1915, six cylinder motor, speed 16 miles.



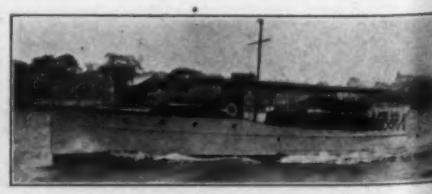
No. 1956—Desirable cruiser, 52 x 11.6, Twentieth Century motor, everything in good condition. Price reasonable.



No. 1625—Twin Screw 60 ft. motor boat, two new six-cylinder Sterling; speed 15 miles.



No. 2144—Fast twin screw motor boat, 60 x 11, Speedway motors; speed 16 miles; good condition.



No. 2167—Modern 50 ft. Cruiser, six-cylinder Sterling motor. Cabin, two double staterooms, etc.

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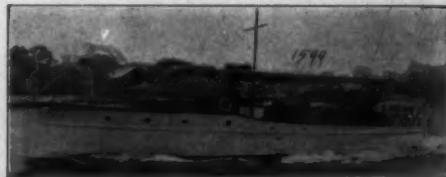
Our list comprises all the available yachts for sale and charter. Below are a few of our offerings. If none of these appeal to you, write us your requirements. Our knowledge of the yachts we offer, and our 22 years' experience in the business, insure satisfaction to any one buying or chartering a yacht through this office.



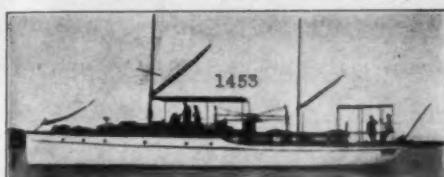
No. 1464—50-foot Express cruiser. Cabin with two sofa berths. Galley, etc. Speed 16-18 miles.



No. 4242—55-foot auxiliary centreboard schooner. Sleeps six in saloon. Speed 6 miles.



No. 1599—30-foot cruiser. Two double staterooms and saloon. Sleeps eight people. Bath, etc. Sterling Engine.



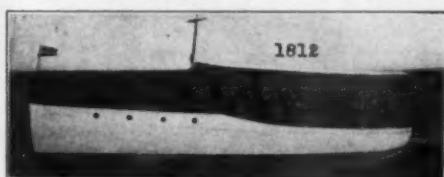
No. 1453—Sale or Charter—65-foot cruising power yacht. Two staterooms. Two Pullman berths in saloon. Bath, etc. Speed 11½ miles.



No. 1344—55-foot cruiser. Stateroom and saloon sleep five people. Bath, etc. Sterling Engine. Speed 12 miles.



No. 1810—75-foot Twin Screw Express Cruiser. Three staterooms; dining saloon, main saloon, bath, etc. Speed 18 miles.



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No. 1674—30-foot cruiser. Cabin sleeps four people. Sterling Engine. Speed 12-13 miles.



No. 4141—95-foot auxiliary keel yawl. Three staterooms; two berths in saloon. Two bathrooms. Sterling Engine. Electric lights. Best yawl of her size afloat.



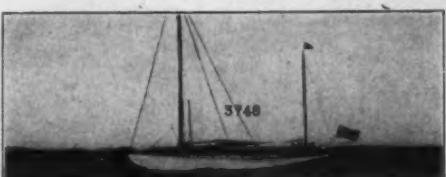
No. 4241—60-foot auxiliary keel yawl. Two staterooms; two berths in saloon. Sterling Motor. Speed 10 miles.



No. 4097—65-foot power houseboat. Two staterooms, two berths in saloon; two toilets, bath, etc. Speed 8 miles.



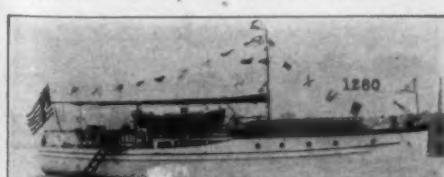
No. 4243—Sale or Charter—65-foot Auxiliary Centreboard Schooner. Draught 6 foot. Stateroom and three berths in saloon. Bath, etc. Now in Florida waters.



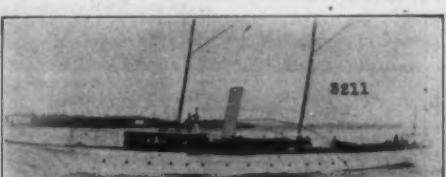
No. 3748—60-foot auxiliary centreboard yawl. Double stateroom and saloon sleep six people. Bath. Electric light. Standard motor.



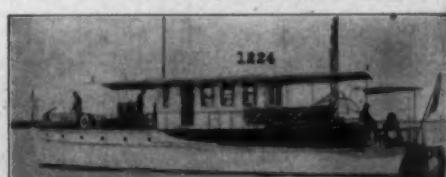
No. 1688—45-foot cruiser. Stateroom and saloon sleep 4 to 6 people. Speed 10 miles. Splendid proposition.



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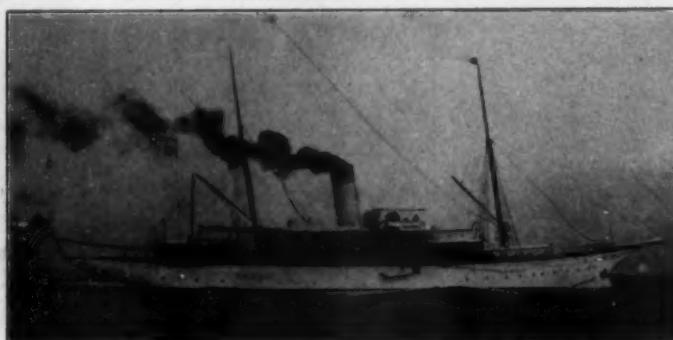
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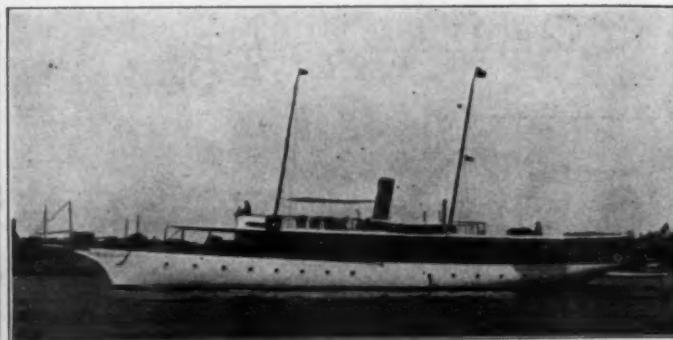
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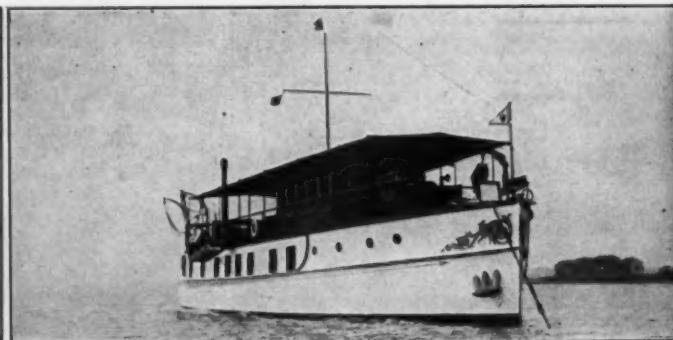
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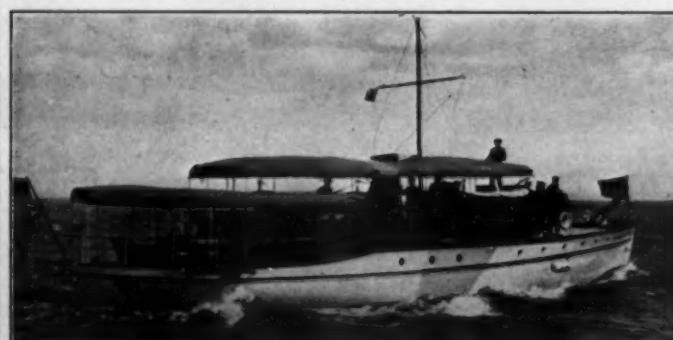
No. 3847—115 ft. Steam Yacht; large accommodations; offered by Estate; reasonable price.



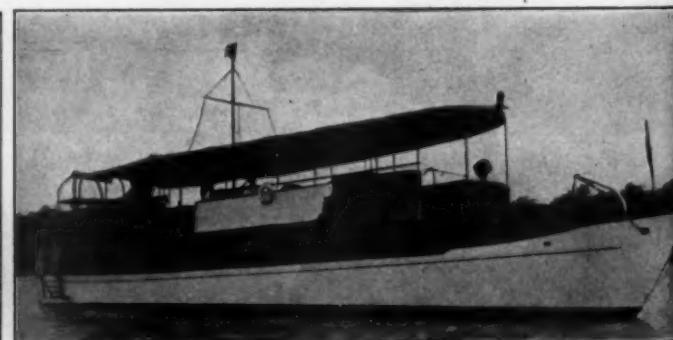
No. 5952—High Class Power Yacht; 100 ft x 16 ft x 5 ft; twin screw; Standard engines; extremely comfortable.



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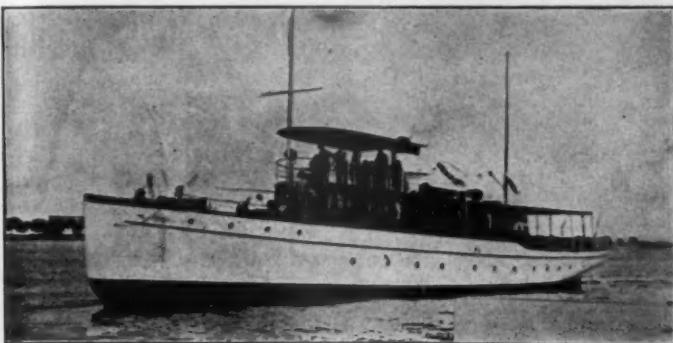
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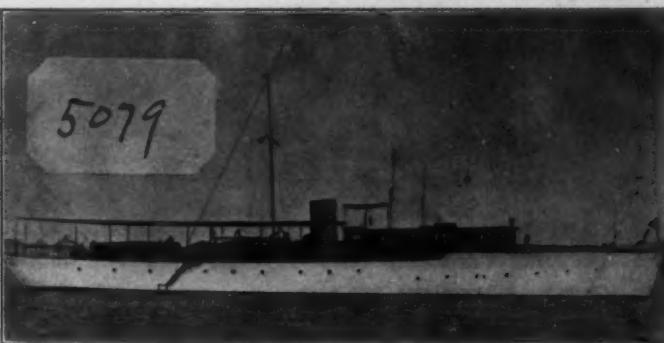
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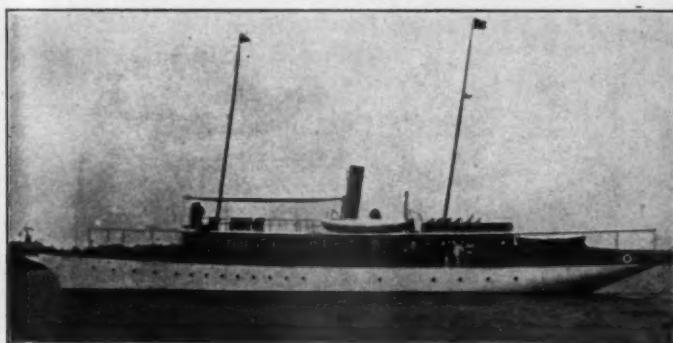
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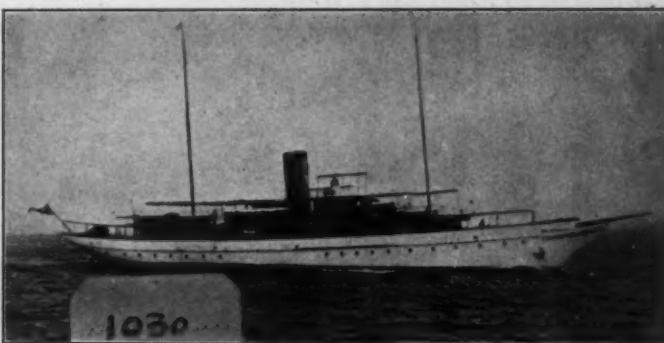
No. 5055—For Sale—Steel motor yacht 110 ft. x 16 ft. x 6 ft. 4 in. draft. Sterling motors. Six staterooms. Large deck house and bridge.



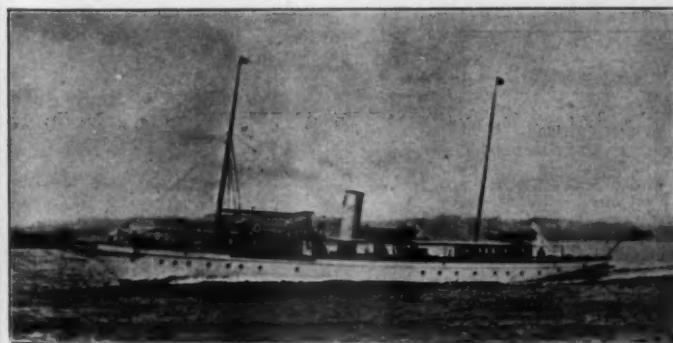
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No. 1030—For Sale—205-foot twin screw, steel, steam yacht. Triple expansion engines. Two Babcock & Wilcox boilers arranged for burning oil fuel. Cruising radius about 6500 miles at 10 knots per hour. Built 1913. Speed up to 15 knots. Every modern improvement.



No. 1011—For Sale—Low price—180-foot steel coastwise steam yacht. 5 staterooms, 3 bathrooms. Speed up to 20 miles.



No. 5125—For Sale—High class bridge deck cruiser, 65 x 12 x 4 feet draft. Speed up to 14 miles. Recent construction.



No. 1057—For Sale—135 ft. steel, steam yacht. Speed up to 16 miles. Oil burning boiler. Excellent accommodations.



No. 5307—For Sale—54-foot twin screw express cruiser. Built 1916. Van Blerck motors. Speed up to 30 miles.



No. 5018—For Sale—85-foot twin screw seagoing motor yacht, perfect condition throughout. Fine accommodations. Speed 12 miles.

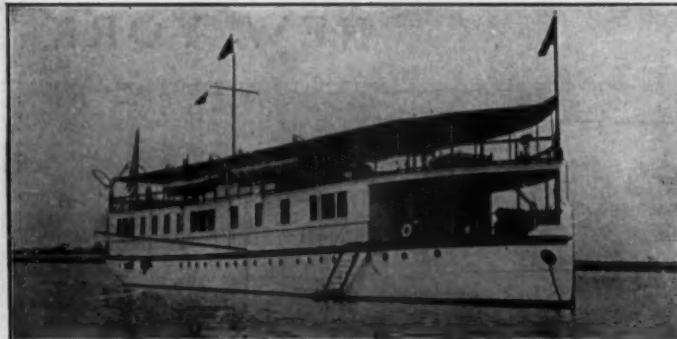
SOUTHERN YACHT AGENCY

American Building

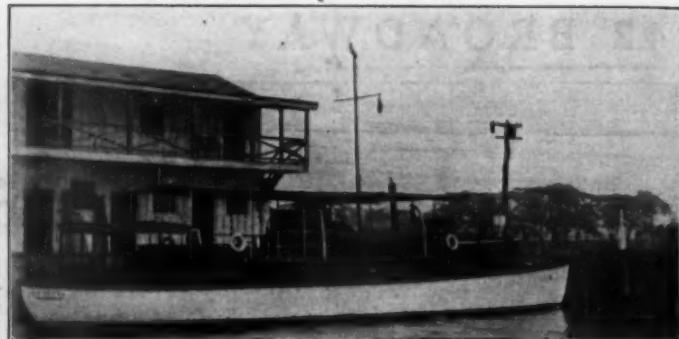
Baltimore, Md.

We have on our list all the desirable yachts available for sale or charter for
FLORIDA

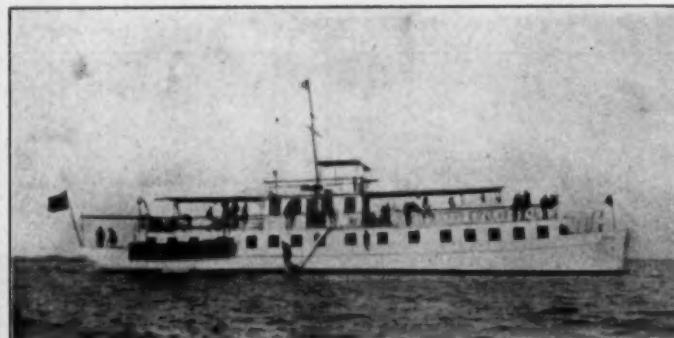
Several representative boats are shown on this page



No. 737—Sale or Charter—125 ft. twin screw. Three saloons. Eight large staterooms. Three baths.



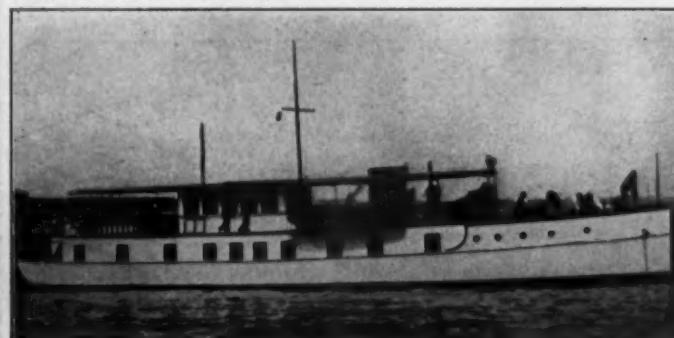
No. 357—Charter—70 ft. excellent accommodations. Especially well adapted for Southern cruising. Very reasonable. Located in Florida.



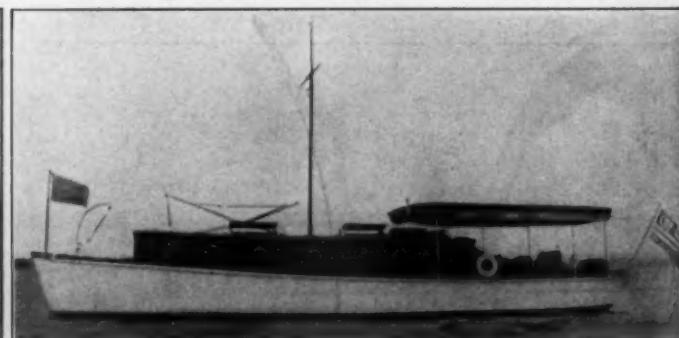
Charter—110 ft. twin screw houseboat. Saloon on deck and four double staterooms and saloon below. Located in Florida.



No. 736—For Sale or Charter—62 ft. over all, 3 ft. 6 in. draught. Two double staterooms, bath, deckhouse and dining saloon. Practically new. Located in Florida.



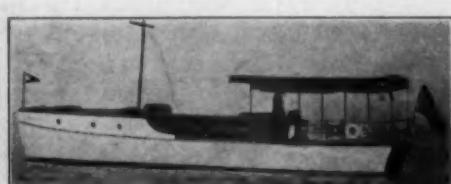
No. 683—Charter—Twin screw houseboat, 95 x 19.3 x 3.3. Social hall on deck. Dining saloon below. Four double staterooms, bath, etc. Heated. Wireless. Located in Florida. Available for April.



No. 709—For Sale—46 feet. 32-37 H.P. Standard 4-cyl. Speed 11 miles. Very handsome. Good as new. Bargain.



No. 571—37 ft. Day Cruiser. Van Blerck motor. 17 miles. Very handsome. Sell less than half cost.



No. 647—Cruiser, 41 x 10.6 x 3.6. Saloon and stateroom sleep six comfortably. Very able. Cheap.



No. 650—Hand V-bottom, raised deck, 33.6 x 8.4 x 3.4. Six-cylinder Loew-Victor. 16 miles.

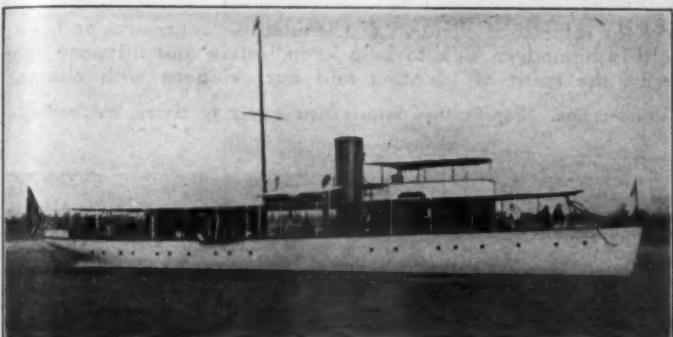
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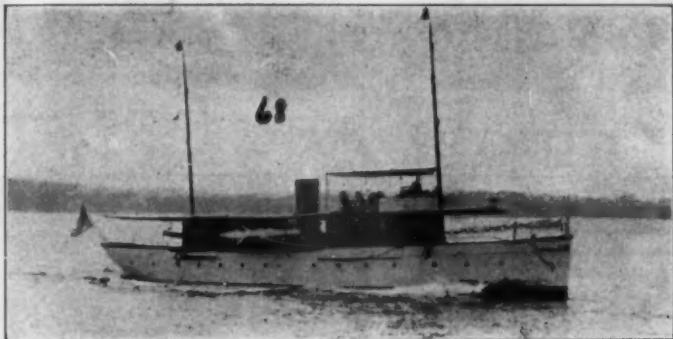
WE OFFER FOR SALE AND CHARTER the most desirable boats of all types on the Great Lakes and Coasts.
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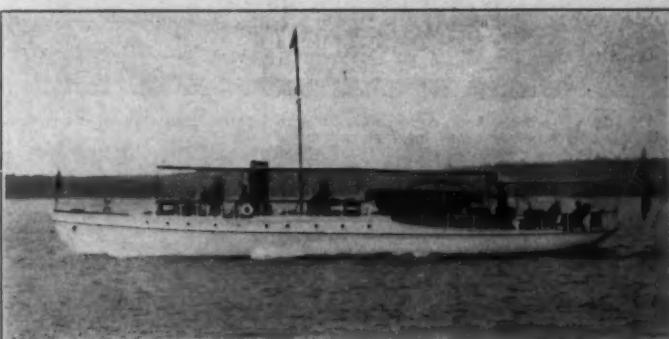
No. 606—For Sale—Modern 122 ft. steel steam yacht. Splendid accommodations. Two deckhouses. Five staterooms.



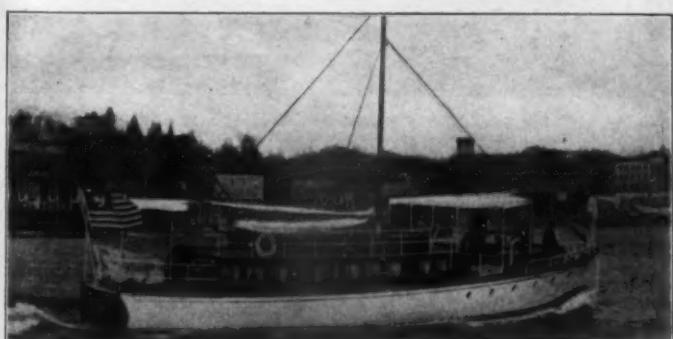
No. 231—For Sale or Charter—Very attractive steel steam yacht. 145 ft. x 18 ft. 4 in. x 9 ft. draft. Sleeps six to eight. Two bathrooms. Speed 18 to 20 miles. Superior boat; in splendid condition.



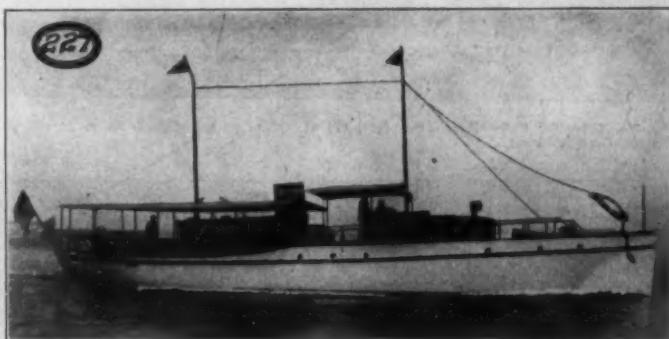
No. 68—For Sale—Twin screw steel motor yacht. 99 ft. x 16 ft. x 5 ft. A very comfortable cruiser with all modern conveniences. Designed for off shore cruising. Equipment complete and boat in first-class condition.



No. 103—Bargain. A very attractive twin screw motor yacht. 75 x 15 x 4 ft. Two staterooms. Complete equipment. Now in Southern waters.



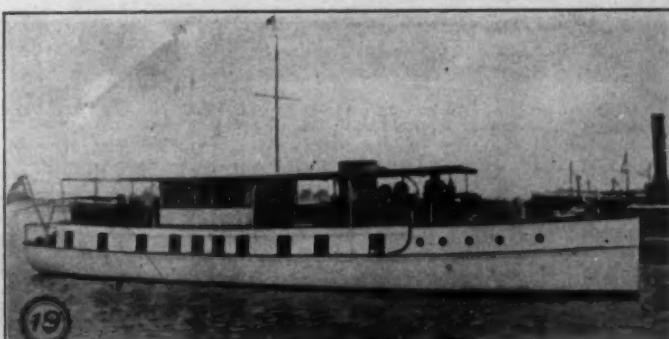
No. 44—For Sale—Modern 55-ft. cruiser. Designed for use in southern waters. Splendid condition. Now in Florida.



No. 227—For Sale—Finest gasoline power yacht of moderate size available. 80 x 16 x 5 ft. 6 in. Built by Lawley 1915. Two double staterooms. Bath. Two toilets. All modern conveniences. Speed 14 miles. Winton motor. Handsomely fitted and furnished.



No. 731—For Sale—"R" Class sloop. Very fast. 37 ft. x 7 ft. 9 in. x 5 ft. 4 in. Splendid condition. Mahogany hull. Built 1914. Complete equipment. New suit of sails 1916.



No. 19—For Charter—Desirable 95-ft. power houseboat. Social hall on deck. Four double staterooms. Modern appointments.

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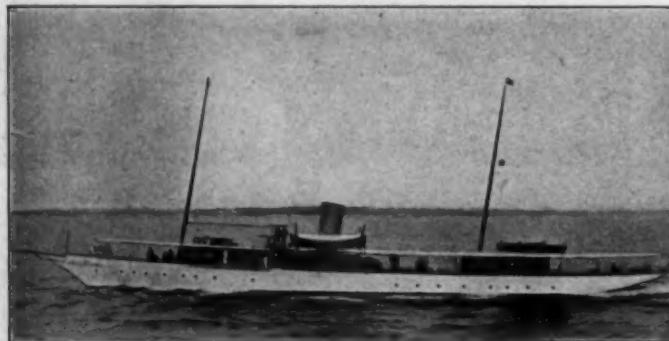
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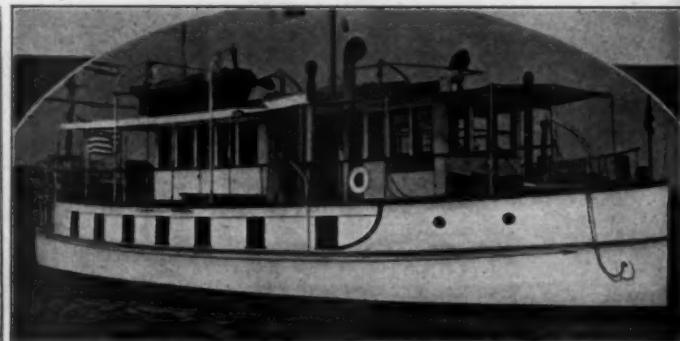
No. 487—For Sale—Auxiliary schooner, 87 x 20 x 11 ft. Fine sea boat. Condition A-1. Sleeping accommodations for 7 persons.



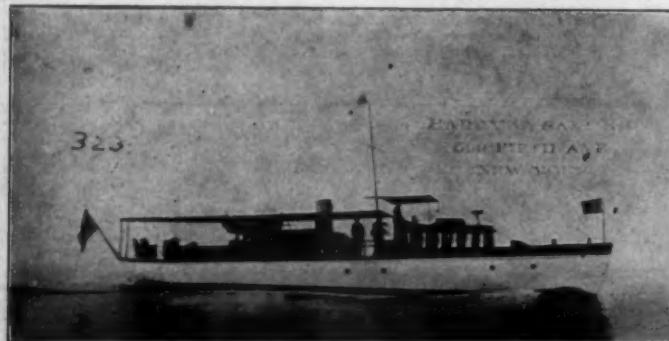
No. 486—For Sale—Exceptionally fine schooner yacht, 127 x 24 x 14 ft.; 4 single, 2 double staterooms, 3 bathrooms. Condition and equipment A-1.



No. 110—For Sale—Handsome, fast, 177 ft. steam yacht. Speed up to 21 miles. 5 staterooms, 4 baths.



No. 190—For Sale—Modern gasoline houseboat, 68 x 21 x 2.6 ft. Luxuriously furnished. Two staterooms; sleeping accommodations for 7 persons.



No. 323—For Sale or Charter—75 x 13 x 3 ft. 6 in. 3 staterooms, 1 bath. Very desirable yacht, handsomely furnished and finished. Speed 12 miles.



No. 557—For Charter—Torpedo type yacht—68'. Speed 17 miles. 1 single, 2 double staterooms. One of the most attractive yachts afloat.



No. 355—For Sale—21' semi-speed boat. Speed 12-14 miles. Owned and used by H. W. Sanford.



No. 414—For Sale—High class 36 ft. runabout. Speed 15-16 miles. Exceptionally well built.



No. 464—For Sale—Very attractive 36' runabout. Speed 25 miles. Hull and engine in best of condition.

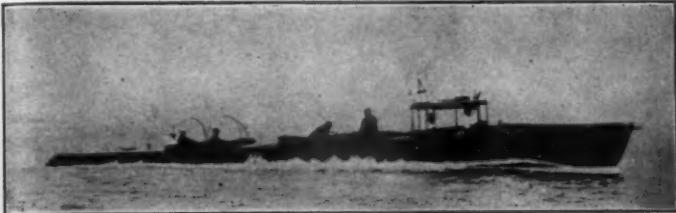
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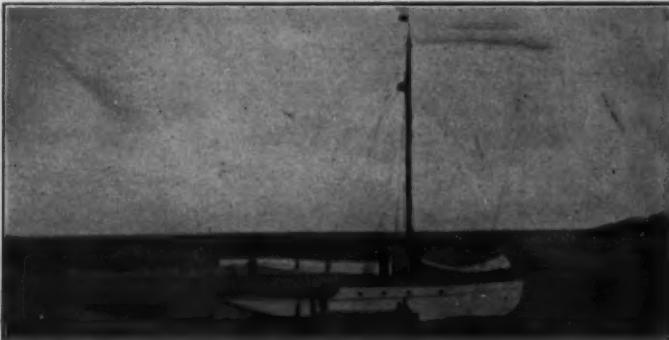
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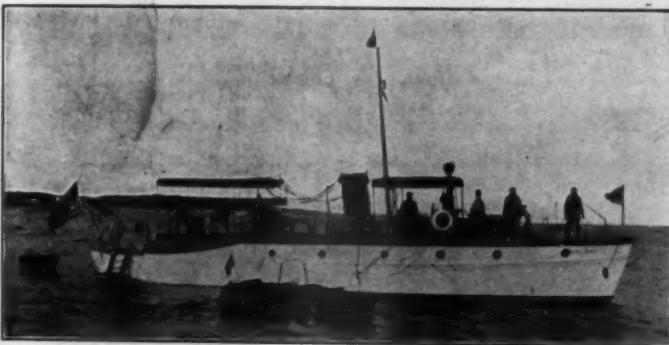
I give personal attention not only to the design and construction of comfortable, seaworthy craft of all types, but offer good boats for sale, charter, and exchange, of which the following are but a few. It will pay you to see me.



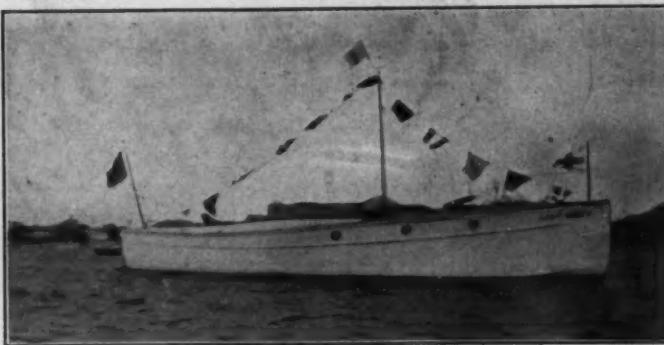
No. 265—For Sale—60 ft. x 8 ft. Lawley build. Double planked. Mahogany. Capable 25 miles with 100 h.p. With cabin added would make attractive express cruiser. Can be equipped with any motor. Hull can be bought right. At Boston.



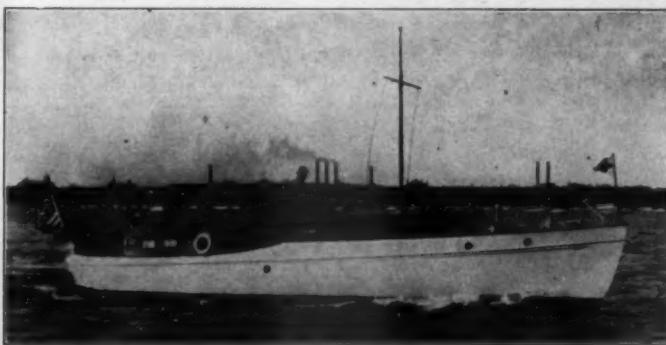
No. 281—For Sale—Economical Cruiser. 38 ft. x 9 ft. 10 in. x 4 ft. 6 in. Lawley design and build 1909. Blount & Lovell 25 h.p. motor gives 8½ miles an hour. Separated from cabin by watertight bulkhead. Fine accommodations. Mahogany and butternut finish. Seaworthy and comfortable. Inspectable at Boston. Best of type available.



No. 342—For Sale or Exchange—Ideal Southern Cruiser. Luxuriously equipped, interior handsomely finished in paneled mahogany, stained glass doors, special bronze electric fixtures, all metal nickel-plated or white metal. Planola, strongly built, copper riveted, independent electric plant, 6 cylinder 70 h.p. Sterling motor, 13½ miles speed, 15 mile hydroplane tender, dinghy, built 1914. 68 ft. x 12 ft. 6 in. x 4 ft. 6 in. 8 in. headroom. Galley forecastle and engine room forward. Saloon, double and three single staterooms, and bath aft. An exceptional boat in every way sold for no fault. Smaller boat accepted in part payment. Seen by appointment only at Boston by applying to me.



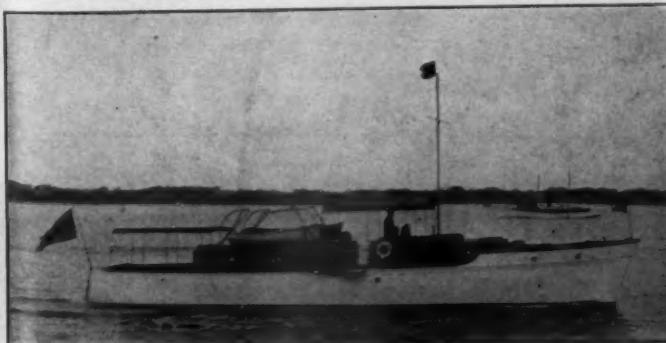
No. 279—For Sale—30 ft. x 8 ft. x 30 in. Hand V-bottom cruiser at Boston. Mahogany planking. Electric lights. Shipmate stove. New. Completely equipped. With 30 h.p. 14 miles. With 100 h.p. 21 miles. Will sell hull with complete equipment and new motor or hull only.



No. 190—Sale or Charter—48-ft. attractive, seaworthy 13 mile cruiser, six cylinder motor, mahogany finish, one saloon, one stateroom. Deed design. Seen Boston. Apply to Deed.



No. 300—Sale—Unusually good 26-ft. seaworthy, comfortable cruiser. Reliable motor. Mahogany finish. Sold only to build larger. At Boston.



No. 320—Sale—Attractive 56 ft. x 9 ft. 6 in. x 3 ft. 6 in. 11 miles cruiser. Standard engine. Capable of 18 miles with more power. Seen by appointment only. Price attractive.



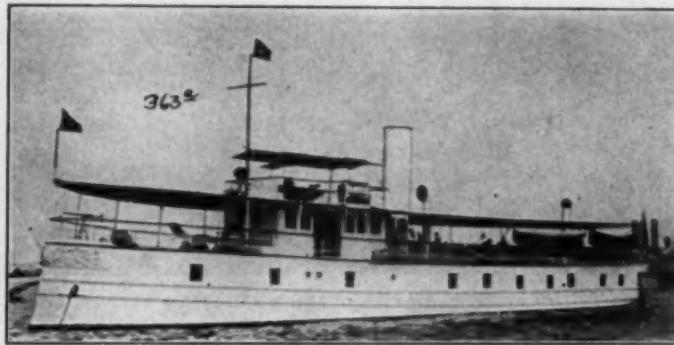
No. 175—Sale—Exceptionally able auxiliary cruising yawl 26 ft. 6 in. long, 30 inches draft. Specially built. Copper fastened. Electric lights. 7½ h.p. motor. Watertight cockpit. Can be bought right. Owner cannot use.

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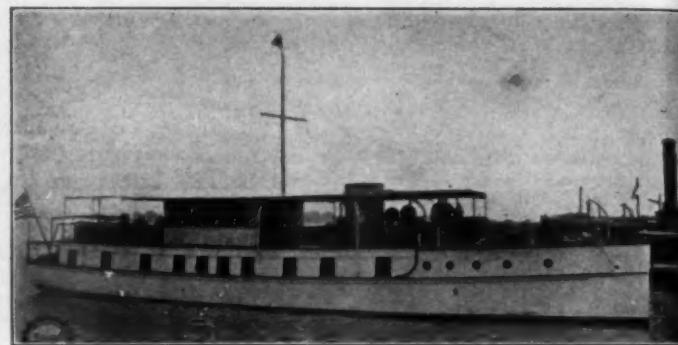
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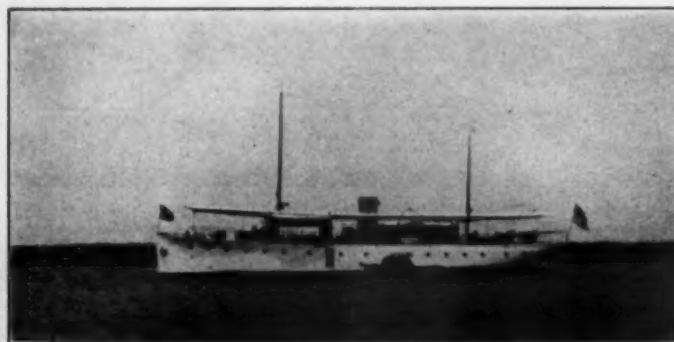
We offer the following Craft which are especially adapted for service in Florida waters. Please advise us of your requirements for this Winter, whether to purchase or charter, and we will gladly submit data regarding suitable boats.



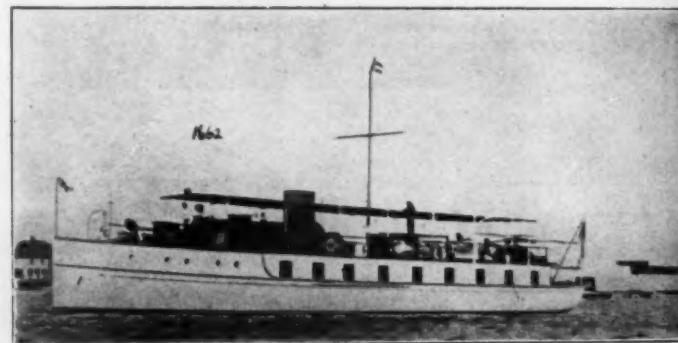
No. 363—For Sale or Charter—Most attractive houseboat of large size; luxuriously furnished; all conveniences; must be seen to be appreciated. Cox & Stevens, 15 William St., New York.



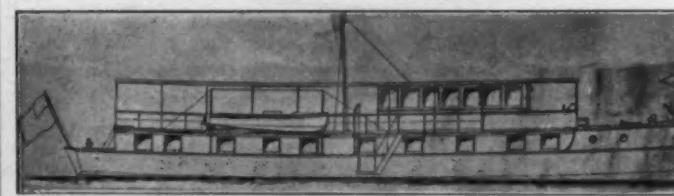
No. 2100—For Charter—Especially desirable, twin screw gasoline houseboat; 95 x 19.3 x 3.3 ft. Speed 12-13 miles. Large social hall on deck, main saloon, four double staterooms, bath, two toilets, etc. Handsomely finished and furnished. Cox & Stevens, 15 William St., New York.



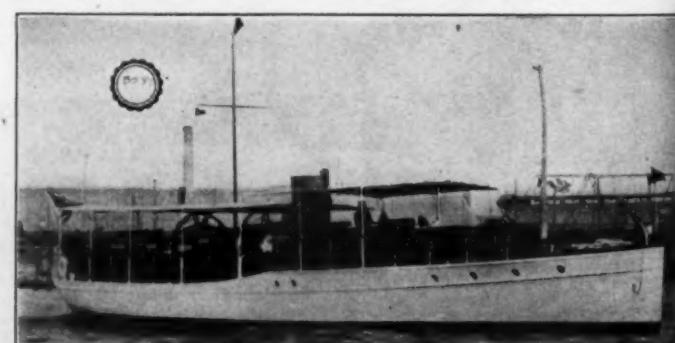
No. 2425—For Charter—Twin screw power yacht; 90 x 16.6 x 4.6 ft. Speed 12 miles. Large saloon, 2 double staterooms, bath and two toilets, etc. Price attractive. Cox & Stevens, 15 William Street, New York.



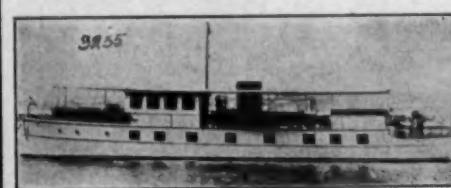
No. 1662—Modern gasoline houseboat, 90 x 17 x 3.5 ft. Speed 10 to 12 miles. Large dining saloon, smoking room, four staterooms, two bathrooms; all conveniences. Best craft of type available. Cox & Stevens, 15 William St., New York.



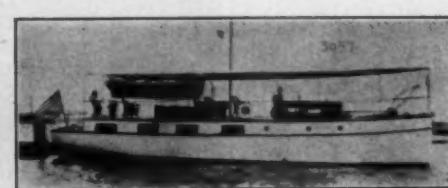
No. 3322—For Charter—Modern power Houseboat; 83 x 18 x 2.6 ft. Speed 9-10 miles. Accommodations include one double and four single staterooms, social hall, dining saloon, 2 baths and 3 toilet rooms, etc. All conveniences. Cox & Stevens, 15 William Street, New York.



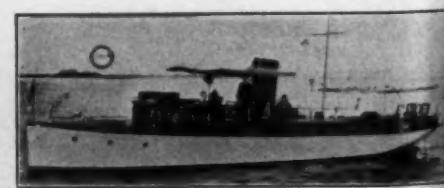
No. 3283—For Charter—Desirable twin screw power yacht; 75 x 16.3 x 3.3 ft. Speed 12 miles. Large dining saloon in deckhouse forward, 3 double staterooms, bath room and 2 toilets, etc. Handsomely finished and furnished. Cox & Stevens, 15 William Street, New York.



No. 3235—For Charter—Twin screw gasoline houseboat; 80 x 16.7 x 2.10 ft. Recent build. Speed 10 miles. Deck saloon, main cabin, three double staterooms, etc. Reasonable figure. Cox & Stevens, 15 William St., New York.



No. 3097—For Charter—Houseboat cruiser; 52 x 14.6 x 3 ft. Speed 8 1/2-9 miles. One double stateroom, 2 transoms in saloon, toilet room, etc. Now in Florida waters. Reasonable price. Cox & Stevens, 15 William Street, New York.



No. 1387—For Sale—Up-to-date twin screw gasoline cruiser; 65 x 11.6 x 4.3 ft. Speed 13-14 miles; 20th Century motors. Dining saloon forward; two double and one single staterooms, bath, etc., aft. Low price. Cox & Stevens, 15 William Street, New York.

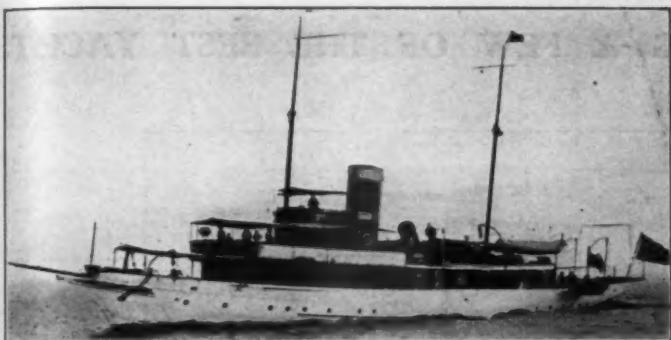
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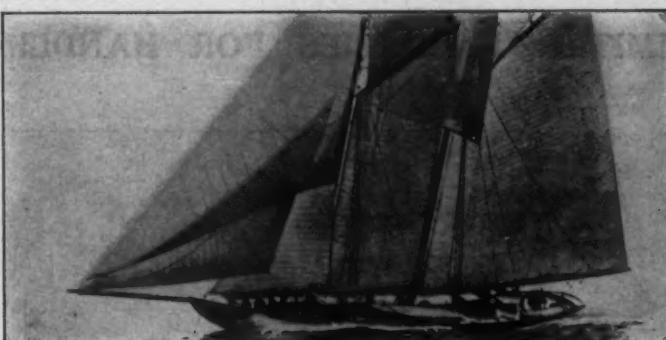
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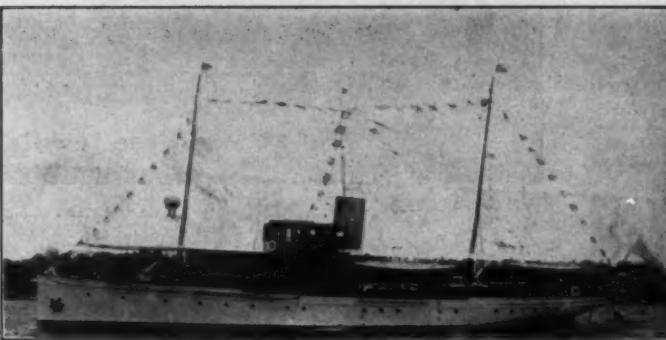
No. 212—For Sale—About 175 ft., heavily built, steel steam yacht, cruising speed 14 knots. Double bottom for water ballast. Five staterooms for owner, two baths. Has wireless equipment.



No. 3241—For Sale or Charter to close an estate—Steel Auxiliary schooner yacht, 114 feet overall.



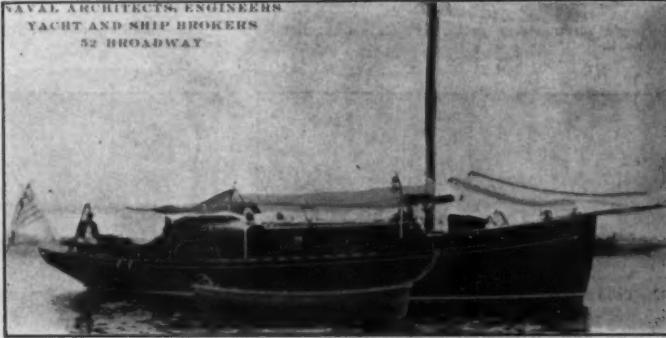
No. 5525—For Sale—75-foot express cruiser, new this year. Three staterooms, deck cabin and saloon. In commission. Owner abroad. Anxious to sell at once.



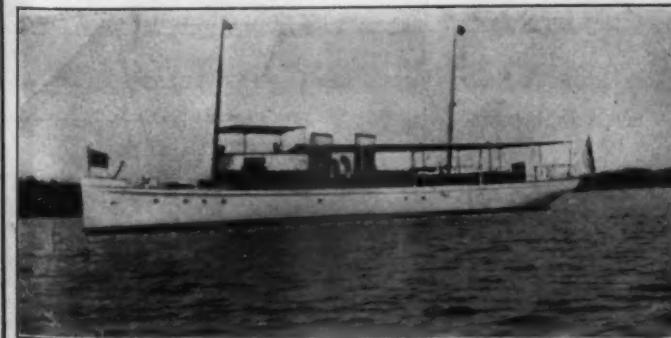
No. 4393—For Sale—94-foot motor yacht, two double staterooms, two baths, hot water heating system. Must be seen to be appreciated.



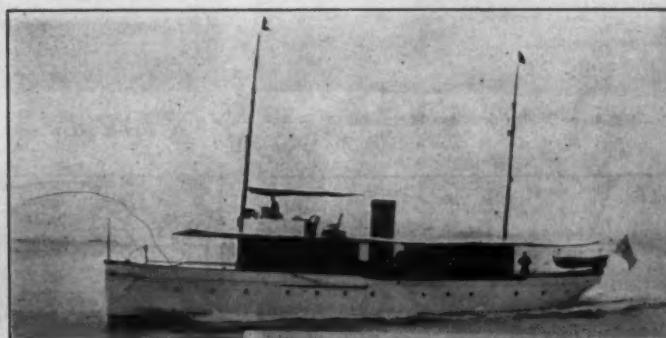
No. 858—For Sale or Charter—125-foot twin screw houseboat, four staterooms, two baths, saloon; large deck room.



No. 3936—For Sale—48-foot cruising power boat with auxiliary sails. 30-40 H.P. engine. Accommodations for four and crew. Bath, toilet, electric lights, etc. Boat now in Florida.



No. 3667—For Sale—At an attractive price, as we have sold owner larger yacht. 83-foot desirable cruiser in commission.



No. 3626—For Sale—98-foot twin screw steam power yacht. Four staterooms, bath room, dining saloon and music room. Very desirable for all around cruising. Owner building larger yacht.

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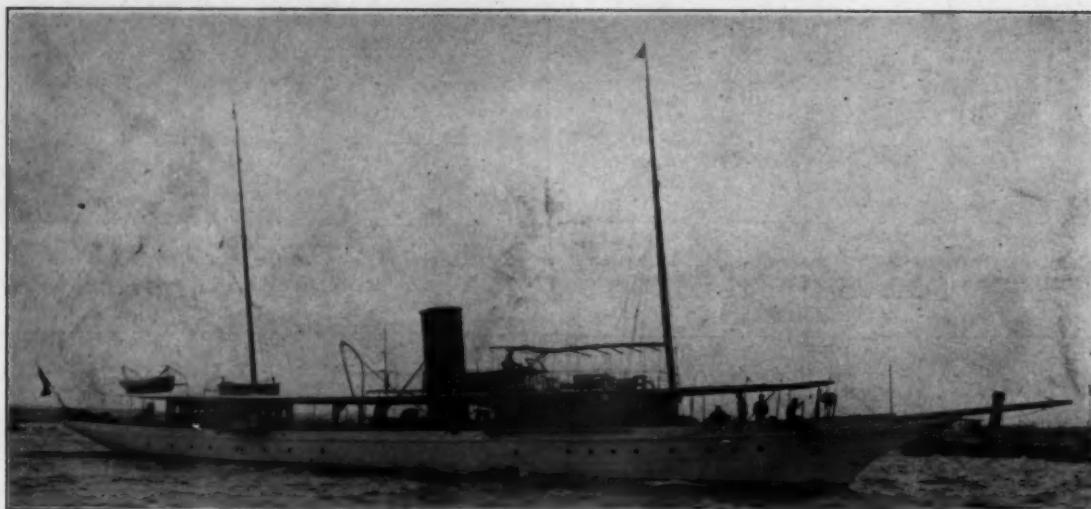
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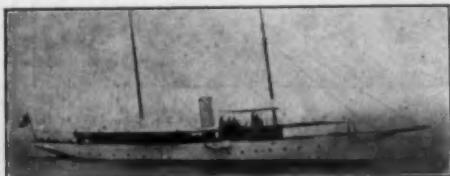
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64—Twin screw steam yacht, 177 ft. o.a. Speed 20 miles



28—Single screw steam yacht, 158 ft. o.a. Suitable
ocean work.



743—Gasoline cruiser, 105 ft. o.a. Liberal accom-
modations.



346—Fast twin screw gasoline cruiser, 118 ft. o.a.
Speed 18 miles.



442—Twin screw flush deck gasoline cruiser, 90 ft. o.a.



2026—Twin screw steel gasoline cruiser, 118 ft. o.a.
Fast.



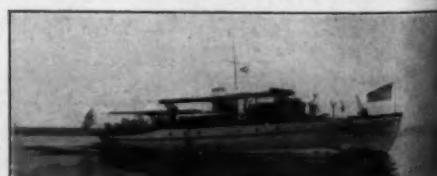
735—Twin screw, 98 ft. gasoline yacht. Fine owner's
quarters.



564—Handsome bridge deck gasoline yacht, 60 ft. o.a.



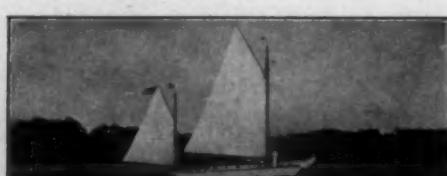
2074—Charter only—Florida twin screw houseboat,
95 ft. x 20 ft. Now South.



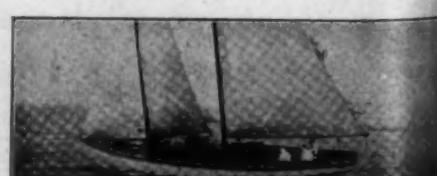
736—Able twin screw gasoline yacht, 75 ft. o.a. Sale
or Charter. Now South.



1002—The most successful Florida Auxiliary schooner
ever built. Burns gasoline or kerosene. 60 ft. x 18 ft.
x 2 ft. 4 in.



1013—Auxiliary yawl, 39 ft. x 11 ft. x 5 ft. Seen
at New York.



511—Powerful off shore schooner, new 1913. 49 ft.
x 11 ft. x 6 ft.

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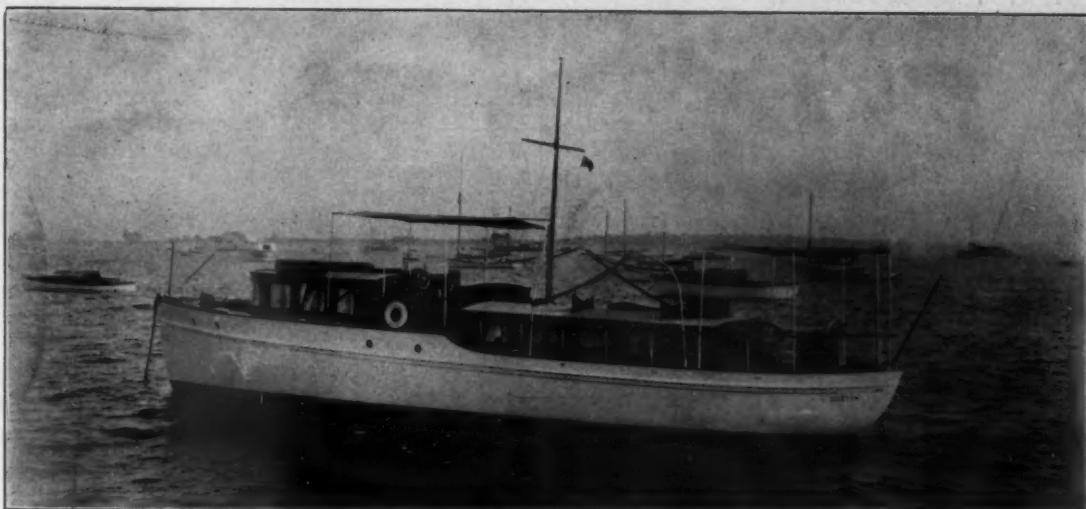
All the available
racing sloops and
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664—The best trade offered. \$5000 Bridge control, 40 H.P. Large dining room forward. Separate galley. Two double staterooms aft. Completely finished in mahogany. In commission. Stored free until Spring.



2082—Handsome finished 62 ft. bridge deck cruiser. 60 H.P.



2100—Sale or Charter—63 x 13 ft. 6 in. Bath, two staterooms, etc.



2077—Semi-houseboat cruiser, 50 H.P. Three staterooms, bath, etc. 55 ft. x 13 ft. x 3 ft.



414—Snappy fast cruiser. Finished in teak. 100 H.P. 6-cyl BARGAIN.



2089—New 1916. Day Cruiser. 58 ft. Twin screw. 26 miles per hour.



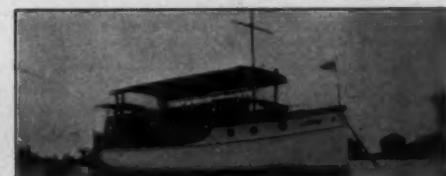
2085—Twin screw, 30 miles per hour, 400 H.P. 54 o.a. Built 1916.



398—Able family cruiser. 45 ft. x 12 ft. Fine shape.



2090—Very low price. 50 ft. bridge deck, 40 H.P.



2086—Florida semi-houseboat cruiser. Large bath, etc.



507—Bridge deck cruiser, 40 ft. o.a. Has record for races.



783—Snappy 40 ft. cruiser, 40 H.P. new 1913.



635—Raised deck cruiser, 30 ft. o.a., full headroom, 4-cycle motor, etc.

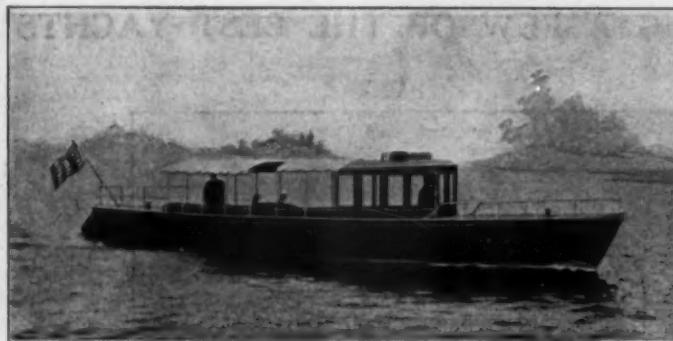
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 Morris Heights Consolidated New York City

OPPORTUNITIES—USED BOATS AVAILABLE

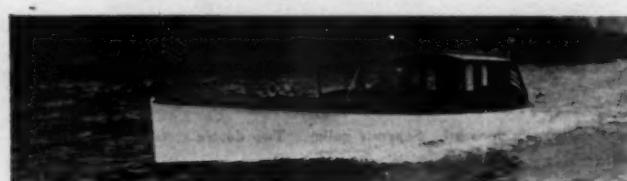
MODERN LISTINGS—Details Sent on Request



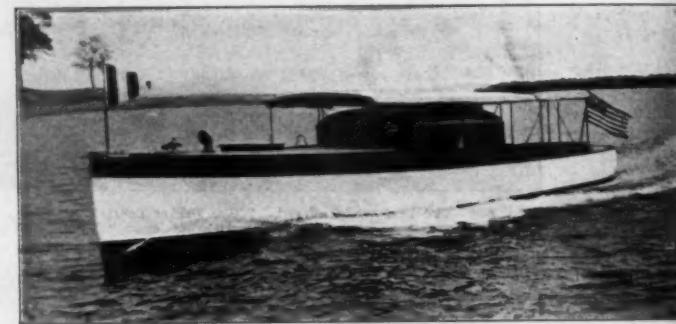
237-M—56 ft. x 7 ft. x 2 ft. 6 in. Day Cruiser. Teak Wood hull, bright finished. 6-cyl. 125 h.p. Speedway engine. Speed, 16 to 17 miles per hour.



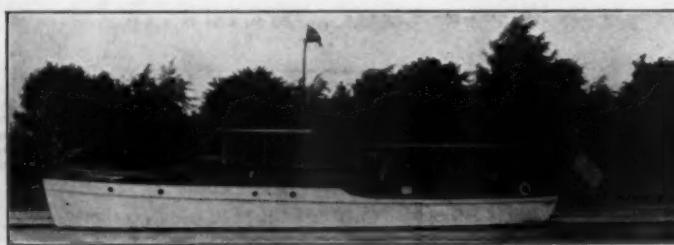
315-M—50 ft. x 8 ft. x 3 ft. Mahogany hull and finish. Gentleman's family runabout; has six-cylinder 60-80 h.p. Speedway engine. Speed, 18 miles per hour. In A-1 condition, ready for immediate delivery.



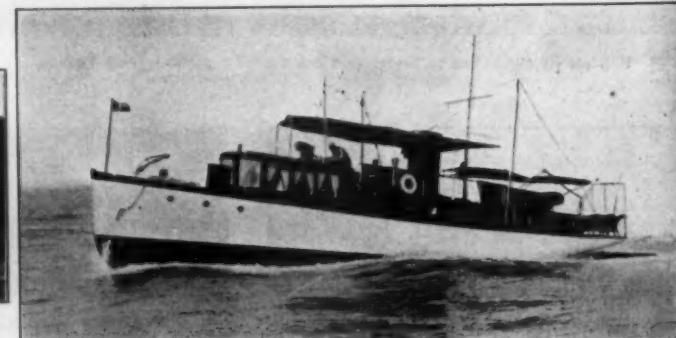
367—Modern family sedan runabout; bulkhead control; new 1916. Cabin with W. C. Completely equipped; motor, 4-cyl. 44 h.p. Speedway. Electric starter. Speed, 18 miles. Price attractive.



367-M—Modern semi-speed Cabin Day Cruiser; 52 ft. x 8 ft. 3 in. x 3 ft. 6 in. New July, 1915. Mahogany finished; motor, 6-cyl. 60-80 h.p. Speedway, controlled from steering wheel; excellent condition. Ready for delivery, Florida service. Speed, 18 miles per hour.



279-M—60 ft. 6 in. x 11 ft. 6 in. 4 ft. Desirable bridge-deck cruising motor yacht; excellent condition. Bridge deck control; stateroom, main saloon and deck house, galley, etc., lighted by electricity. 7½ by 10, 4-cyl. Murray & Tregurtha; large cruising radius. Moderate price.



365-M—Bridge deck Cruiser, in commission. Ready for delivery, perfect condition. Length, 65 ft.; beam, 12 ft.; draft, 4 ft. Speed, 12 miles per hour. Powered with two Speedway 48 H.P. motors. Controlled from Bridge deck.



121-M—Twin-screw Trunk Cabin Motor Yacht. 76 ft. x 12 ft. x 3 ft. Sleeping accommodations for eight. Independent lighting set; in fine condition; price low for immediate sale. Speed, 12 miles per hour.



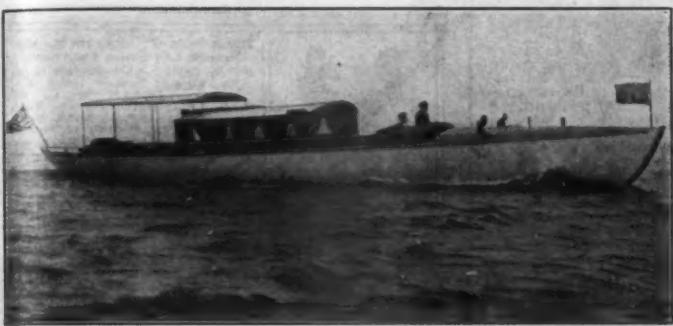
365-M—1916 Speedway military Scout Express Cruiser. Sleeps four, two cabins; motor, 6-cyl. 60-80 Speedway. Electric starting and lighting; control entirely from steering wheel; speed, 15-16 M.P.H. Windshield across front of bridge deck; attractive price. Completely equipped.

THE MoToR BOATING MARKET PLACE

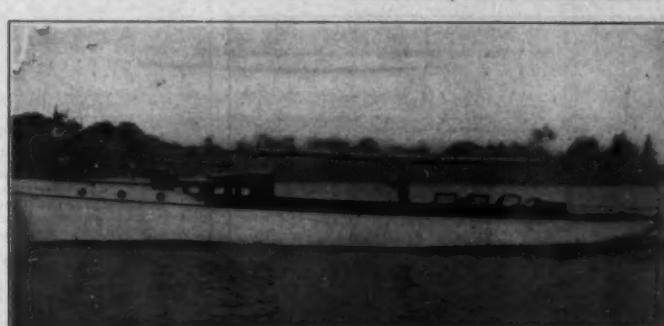
The rate for "For Sale" and "Want" advertisements is 3 cents per word, minimum 75 cents. If an illustration is used, the charge is as follows, which includes the making of the cut: Cut one inch deep, one column wide. \$2 Cut 1 1/2 inches deep, 1 1/2 columns wide. \$5 Cut three inches deep, three columns wide. \$15

Opportunities for the Motor Boatman

Before you buy or before you sell examine the exceptional buying and selling opportunities under this heading. They comprise the best offers of the month. Please mention MoToR Boating.



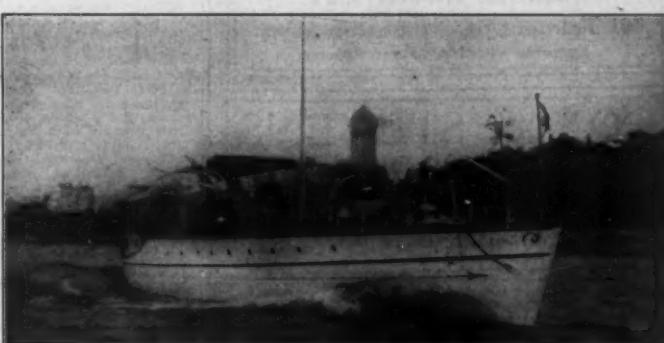
Elco de Luxe day cruiser, 54 x 9 x 2 ft. 8 in. Standard motor. McIntosh Agency, 32 Broadway, New York City.



Day Cruiser "Sunbeam," 56 x 9 x 3. Built 1909, Robt. Jacob, 20th Century motor. Price, \$4500. McIntosh Agency, 32 Broadway, New York City.



No. 1816—For Sale by an estate—125-foot twin screw steel houseboat. Unusually well adapted for use in Southern waters. Eight staterooms, each having brass bed, main saloon, dining saloon and observatory, three bath rooms, hot water heating system, large upper deck covered with awning. Attractively furnished. Most of the upholstery was new this fall. Must be seen to be appreciated. For plans and further particulars apply GIELOW & ORR, 52 Broadway, N. Y., or your own broker.



Motor Yacht Osprey II, 80 x 14 x 4, two Standard motors. McIntosh Agency, 32 Broadway, New York City.

FOR SALE—24-foot runabout, Erd four-cylinder engine, removable decking and hatches over engine, three cross seats, auto control, plainly and simply built. Price \$600. John M. Keen, 340 Clifton Ave., Newark, N. J.

Van Blerck, Model B, 4-cylinder, 5 x 6, complete with Automatic Oiler, Air Compressor, Bosch Magneto, Reverse Gear, perfect condition guaranteed. Price \$350.00. Edward vom Hofe & Co., 112 Fulton St., New York City.

EXCEPTIONAL BARGAIN—One 80 to 100 H.P. Van Blerck, 6-cylinder engine. Bought for experimental purposes and run only a short time. In perfect condition and complete in all respects. Price \$650. Sutter Marine Equipment Co., Canarsie, Brooklyn, N. Y.

WANTED—Power cruiser, near Boston preferred, 40 ft. to 60 ft. long, in good condition, comfortable accommodations inside, reasonable price, full particulars. Box 6, MoToR Boating.

1 1/2 H.P. Eclipse motor, good condition, \$20.00. Lot of marine hardware left from boat livery. Write for list. Elmer Calkins, Petoskey, Mich.

FOR SALE—One Waterman Outboard, demonstrating motor good as new \$42.00. One Wisconsin lightly used \$40.00, none better run O.K. E. W. Bennett, Southampton, N. Y.

FOR SALE—20-horse Mianus engine, 2-cylinder, 2-cycle, perfect condition, nearly new, 3-blade wheel, generator, clutch built-in. \$200.00. Will consider exchange for 30-horse engine. Maxwell's Boat-Yard, Newark, N. J.

WANTED—Power houseboat about 65 feet. State make, age and give full particulars. Box 5, MoToR Boating.

FOR SALE—Day Cruiser built 1915. Designed by Hacker. Speed 15-18 miles hour after hour. Splendid sea boat. Toilet, water, electric lights. Equipment especially complete. Enging 60 H.P. 6-cyl. Loew-Victor, new with boat. This is a high-class V-bottom outfit. C. C. Co., 168 West High Street, Carlisle, Pa.

Lamb Engine Owners take notice where you can buy Lamb Engine parts. Ed Keil, Glenworth Ave., North Beach, L. I.

FOR SALE—100 H.P. 20th Century motor, 6-cylinder 8 x 10. All complete and is as good as new. Can be seen running. Reason for selling can't swing large enough wheel on boat. Price \$2000. Apply MoToR Boating.

FOR SALE—A 2-cylinder, 4-cycle, heavy duty Sterling engine, 10 H.P., 4 1/4 x 6 complete with reversing gear. Universal coupling, 20 x 20 propeller. Engine never used. (Affidavit to this effect if necessary.) Reason too large for boat. Cost \$400. Address R. F. Hogan, Box 893, Cincinnati, Ohio.

Used Engines Completely Overhauled and Guaranteed to be in Good Running Order.

BUFFALO—4-cyl. 15 h.p. Complete with reverse gear and electrical equipment. \$250.00.

MURRAY & TREGURTHA—4-cyl. 40 h.p. Complete with reverse gear, Bosch and Delco double ignition. \$550.00.

GRAY—12 h.p. 2-cylinder. Complete with electrical equipment. \$75.00.

VIM—3-cylinder 19-23 h.p. Complete with reverse gear, elevated rear starter, Mea magneto and Delco ignition. \$250.00.

GRAY—6 h.p. Complete with waterproof ignition. \$60.00.

EAGLE—4 h.p. Complete with electrical equipment. Schebler carburetor, practically new. \$65.00. Walter H. Moreton, 214 State St., Boston, Mass.

Runabout of exceptional merit. This beautiful V-bottom motor boat is especially designed for those who desire a snappy craft of seaworthiness and speed. She makes 20-22 miles. Is lavishly equipped. Powered with 50 H.P. 4 cyl. Sterling motor new 1916. C. C. Co., 168 West High St., Carlisle, Pa.

CANADIANS, Second-hand engine bargains. Send for list. GUARANTEE MOTOR COMPANY

73 Bay Street, North Hamilton, Ont., Canada

MOTORS.

Hundreds of fine motor values from one to six cylinders in all the most desirable sizes of the best high grade makes, at very low prices. Magnets, carburetors, timers, coils, axles, transmissions, steering gears and supplies of every nature. Send for big free list and state your requirements before buying. Badger Motor Company, Milwaukee, Wis.

USE "SNAPPER" ENGINES for your small boat. They are a big little engine built by The Automatic Machine Co., Bridgeport, Conn.

Cruiser full head room, large cock pit, galley, toilet room, Globe engine, cedar planking, salt water fittings, 36 x 8.10 x 2.8. A real boat. Fine condition at Atlantic City. Can be inspected by appointment. Owner, 2037 Commercial Trust Building, Philadelphia, Pa.

SPEED PROPELLER PATENT for sale. Brand new style on simplified scientific lines, guaranteeing more speed equal number revolutions against any propeller in the world. "PATENT," care of MoToR Boating.

FOR SALE—A new runabout and engine, \$500. 22-foot Hand "V"-bottom, powered with 20-30 Lamb engine, will average 22 miles, and 25 when tuned up. New engines afford pleasure and no worry. If you are particular, investigate. Correspondence invited. Al Lozier, Box 95, Jacksonville, Fla.

AT A BARGAIN

100 H.P. C-6 Van Blerck, unit power plant, absolute perfect condition, all copper jacketed manifold. Paragon gear, Bosch dual 2 point ignition, ideal for runabout or express cruiser. Care MoToR Boating.

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Whistle Blower Outfits

Blower runs by friction contact with engine fly-wheel. Whistle of brass, nickel-plated.

3 sizes, \$10, \$15, \$20.

Trimount

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All bronze composition. Suction lift 6 to 20 feet. A lifelong convenience.

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(Factory: Whiting Ave., East Dedham, Mass.)

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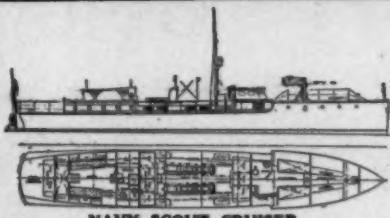
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ing, Kermath, Missouri, Harris, Eagle. Write for
offer.

U. S. P. S. Plan Winter's Work

(Continued from page 53)

problems, navigation contests, etc., are worked out, in
order to keep the members' interest.

In Series E, miscellaneous studies are pursued.
First meeting, knots and splices—Each member is
provided with a length of half-inch diameter line,
and, with an instructor or member present, who is
familiar with knots and splices, practices the following:
bowline, bowline on a bight, running bowline, reef
knot, fisherman's bend, short splice, eye splice and long
splice.

Second meeting, aid to the injured—A discussion
of the medical supplies which should be carried aboard
every motor boat. A medical man talks on first aid
to the injured, poison antidotes, etc. Resuscitation
of a drowning person is discussed and practised. A
demonstration of the pulmotor is given.

Third meeting, weather—Members procure copies
of Commander Bennett's handbook on the weather,
and use this as a basis for the third meeting. (Many
suggestions are given in Com. Bennett's book, which
could be worked up into a very entertaining and in-
structive illustrated meeting.) When possible, the
services of an authority from the U. S. Weather Bureau
are secured and a lecture is heard on forecasting the
weather.

Fourth meeting, Government data up to date—A study of the
Notices to Mariners, Light List, Buoy List, Coast
Pilot, Tide Table, and Chart Catalogue. (Each member
procures a copy of each of the above publications,
and brings it to this meeting.)

Practical navigation is touched upon in Series F.
First meeting. The log, lead, sounding machine,
pelorus, barometer, sextant, artificial horizon and
chronometer.

Second meeting. Methods of reckoning time, the nautical
almanac, conversion of times, refraction, dip,
parallels.

Third meeting. (On board a boat.) Practice in
using instruments taken up at first meeting, deter-
mination of latitude by the different methods.

Fourth meeting. Determination of longitude by
the different methods.

Series G is a series of four illustrated lectures by
officers of the Department of Commerce or of the
merchant marine along the following general lines:

First meeting. The steering of steamers, factors
entering in, ship and screw going ahead, ship and
screw going astern, ship going ahead with screw back-
ing, turning in a limited space, effect of wind, sea,
shallow water, heeling, etc.

Second meeting. Handling a steamer alongside a
dock. Effect of lines, helm, current, etc., working
into a slip, using a tug, etc.

Third meeting. Towing and handling in heavy
weather, the towline in heavy and smooth seas, tow-
ing a disabled vessel, towing behind and alongside,
etc. Laying-to, sea anchors, riding out a gale, use
of oil, etc.

Fourth meeting. Rescuing the crew of a wreck, man
overboard, handling boats alongside a ship, handling
boats in a surf.

Questions for Four Meetings of Series B

I.

- What is a steam vessel?
(a) What is a motor boat?
(b) What is a motor boat considered
if under sail and power?
- What is a steam vessel considered if
under steam and sail?
- Under sail alone?
(a) How distinguished by day?
(b) By night?

II.

- When is a vessel under way?

III.

- Describe position, range of lights and
visibility of all lights on a steam
vessel except sea-going steamships
and ferry boats.
- Lights on sea-going steam vessels, and
what additional light may be carried
and where?
- What is the object of screens for lights?
- Length of screens for motor boats, Class
2, Class 3 and steam vessel?
- Sailing vessel lights under way?
(a) Being towed?

- What is the difference in height of the
after range light on motor boats and
steam vessels?
- Lights carried by towing vessel, inland
and sea-going, and what indicates
length of tow? Lights on steam ves-
sel being towed?

- What size vessel and under what con-
ditions may she not keep lights fixed
and what must she do with her lights?

- What do you know about rowboat lights?

- Lights of pilot boats under way and at
anchor?

- Light shown on a fishing vessel under
way and not trawling or dredging—
under ten tons?

- (a) Over ten tons?
(b) Lights shown by vessel trawling,
dredging or fishing with any kind
of nets or lines?

- Lights for rafts and current-propelled
ferries?

- What may a vessel with no after range
light do when being overtaken by
another vessel?

- What lights are used and where carried
on vessels at anchor under 150 feet?

- (a) Over 150 feet?

- What shall a vessel do to attract atten-
tion in addition to lights?

- What lights, when towing a submerged
wreck?

- (a) What signals in day time?

- What are the day and night signals for
a vessel moored over submerged
wreck?

- (a) Stationary dredge?

- (b) Self-propelled suction dredge?

- (c) What light when submarine pipe is
being laid?

- Give the lights on canal boats and barges
in tow, singly, in pairs, or alongside
in the Hudson River, and in other
waters except the Hudson River, etc.

- Lights in scows in tow.

- (Continued on page 86)

WIRELESS SPECIALTY APPARATUS COMPANY

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Complete line of Motor Boat Supplies.

Motor Satisfaction

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Extremely fine for canoes and light boats.
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Aluminum base, copper water-jacket,
steel shaft, bronze bearings.

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If you are interested in making this summer
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Dependable Spark Plugs

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With Champion Priming Plugs in your motor you have nothing to fear from cold weather.

Simply open the needle valve on the side of the plug and pour in a few drops of gasoline. It flows right to the sparking points. Then shut the needle valve and give your motor a quarter turn.

It starts immediately.

It's very simple—and you save yourself a world of trouble.

These Champion Priming Plugs are genuine dependable Champion Spark Plugs—with the addition of the priming device.

A key lock attached to the needle valve makes opening and closing very easy. And you cannot lose the key. It is fastened on.

Put a set of these priming plugs in your motor today and get rid of the cold weather starting problem.

Your dealer has them—and they are backed, like all other Champion Plugs, by our iron clad guarantee.

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Complete satisfaction to user, or free replacement, repair or your money back.

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Toledo, Ohio**



- Nineteen-Seventeen Equipment & Accessories for Motor Boats -

(Continued from page 56)

line to choose from, it is natural for the Stamford Foundry Co., of Stamford, Conn., to assert that it is unnecessary for the buyer to decide upon which range to purchase—but merely to determine what size of shipmate it is that he requires.

Michigan Wheels

The Michigan Wheel Co., of Grand Rapids, Mich., is one of the oldest concerns in the marine line, and its business has increased from year to year, until it is now one of the busiest companies making a specialty of solid propeller wheels. These wheels are suitable for all types of motor boats, including runabouts, racers and working craft. Another propeller of this concern is the famous Michigan weedless, which, it is said, will drive a boat through the densest weeds. Two- and three-bladed reversible propeller wheels adapted to all types of motor boats are another specialty of the company. These take the place of reverse gears and, it is declared, require no attention, while giving perfect control in full speed ahead, neutral, and reverse. An enclosed type of reverse gear of Michigan manufacture was introduced a little less than a year ago, and this concern also offers a complete assortment of brass and bronze marine hardware.

McClellan Tops and Hoods

One of the Simplicity spray hoods manufactured by Chas. P. McClellan, of Fall River, Mass., is shown in an illustration on page 56. These hoods are especially adapted to open boats and are extensively used in Government service. They are declared to be positive in operation and simply and quickly put up or down. An important feature is that no pins, nuts or screws are used to attach or detach the framework, all fixtures being lever-locked. These hoods are made in three styles with brass or white oak frames. Auto boat tops are also a specialty of Mr. McClellan's, and he turns out a one-man top which is declared to combine utility and grace in a high degree. This one-man top is built to order in lengths up to 14 feet, and one of its foremost features is an arrangement whereby the forward part of a boat's cockpit may be left open or covered, as the owner prefers.

The de Forest Wireless Telephone
One of the newest things under the sun is the de Forest wireless telephone, by which it is possible for owners of wireless-equipped boats to converse with each other as readily as conversations ashore are carried on over the ordinary telephone. As a demonstration of the practicability of this device an experiment was recently made in which ships at sea near the port of New York and many amateur wireless operators had the pleasure of listening to a two-hour program of musical selections. At the record laboratories of the Columbia Graphophone Co., there was installed a de Forest undamped wave transmitter known as the oscillation, in conjunction with a Columbia Grafonola, on which were played some of the Columbia records. At the Hotel Astor there was located a de Forest receiving set, together with horns and de Forest amplifiers for reproducing the music in great volume. When the concert began one could hear the violin strings as perfectly in the banquet hall of the Hotel Astor as if the violin itself had been there. This feat was accomplished by the persistent efforts of Dr. Lee de Forest and his staff. Dr. de Forest plans to furnish these wireless telephone and telegraph transmitters for motor boats and yachts, and in the near future we may see the time when all the yacht clubhouses will be furnishing music to many of their members located several miles away.

Marine Compass Specialties

Three specialties of the Marine Compass Co., of Bryantville, Mass., are the Cole bearing finder, the Cole course protractor and the Perfect underlighted compass. The underlighted compass was designed specifically to obviate the eye fatigue which is caused by glaring light. The design is such that the light is directly on the points needed by the helmsman, and there is no other light on the compass to distract or confuse the eyes. Another advantage claimed for it is that it enables the helmsman to see better and work faster with fewer mistakes. The light and fixtures are entirely protected against damage, but are easily accessible for examination if need be. The Cole bearing finder is a device to enable the small boat owner to find his bearings on landmarks with a minimum loss of time and with maximum accuracy. It is a small attachment which may be fastened to any make of compass. The Cole course protractor is a useful instrument for laying out a course or taking course bearings. An unlimited number of courses may be taken without resetting the instrument, and variation and deviation are applied automatically. With this protractor allowances for drift and current may be made. No sliding is necessary as with the ordinary parallel rulers, and it will work as well on a wet chart as on a dry one.

McFarlan & Spilker Offset Strut

Although the offset shaft strut manufactured by the McFarlan & Spilker Mfg. Co., of Cincinnati, O., has been on the market for only a year, it has succeeded in demonstrating its popularity. This offset strut is self-aligning in a new way which enables the use of a one-piece shaft bearing swiveling in and on the side of the strut arm. The arm and the shaft bearing are of cast manganese bronze, and the bearing is unusually long, giving years of constant service. The bearing is a feature of considerable prominence in this strut, as it does away with all fitting, babbittting, etc.

Pfanstiehl Starter Coil

Owing to the fact that at slow speed a magneto has a primary current of very low voltage, thereby making starting difficult, the Pfanstiehl Co., of North Chicago, Ill., has produced the Pfanstiehl starter coil, which is designed to eliminate this trouble. Either six dry cells or a six-volt storage battery is used with this

coil, which system is an advantage in itself, as it gives a higher primary current. In operation the current flowing through the starter coil is constantly interrupted by a high-speed vibrator, and, in starting, this rapidly interrupted primary current is switched to the primary windings of the magneto armature, or to the high-tension coil when the battery system is used. It results that every time the circuit breaker opens to give a spark at the plug, the rapidly interrupted primary current produces a series of sparks in the combustion chamber. It is stated that under some conditions these sparks number as many as sixteen instead of the one spark ordinarily supplied. The result is said, is the production of the maximum heat of spark and maximum possible time for the mixture to ignite. In addition to this coil the Pfanstiehl Company turns out a full line of ignition specialties.

Baldridge Gears

So satisfactory has been the success of the Baldridge Gear Co., of Detroit, Mich., in the sale of its line of Baldridge gears that practically no change will be made in these products for the 1917 season. These gears are of the balanced planetary type with a single shaft which is supported by long main bearings at both ends, thereby eliminating binding, sagging, heating or grinding. They are as light and as compact as correct designing will permit without the sacrifice of strength or durability. They are entirely enclosed, thus keeping water out and the oil in. No moving parts are exposed. Six types of gears are offered for transmitting any power from 3 to 75 h.p.

Rebuilt Marine Motors

According to Edmund V. Parr, of Bruns, Kimball & Co., of New York City, the business of rebuilding used marine motors has been elevated to a very high plane by this concern, so that it is possible for the purchaser of a rebuilt motor to expect almost if not fully as much satisfaction from it as from a new motor. All motors which come to the Bruns, Kimball shops are taken down and gone over very thoroughly. In engines which have not had much use and are apparently in good condition, there are gaskets to be replaced with new ones, carbon to be removed, bearings to be taken up and sometimes cracks in the base or other defects which may be remedied, and which would not have been discovered except under a careful inspection. In many cases it is necessary to regrind the cylinders and fit new pistons and rings. The old method was to bore out the cylinder, but if the walls are not badly scored the proceeding followed by Bruns, Kimball & Co. is to grind it on a heel grinder, as this does not weaken the cylinder as much as reborning does. When the wall is too thin for safety, new cylinders are supplied. In the case of motors which have come in for a good deal of service it is often necessary to supply new valve guides, gears, etc., and on certain types of engines having long camshafts of small diameter and only two bearings, a center bearing is made and fitted. It may therefore be seen that the rebuilding is done in a most painstaking manner. In spite, however, of the general excellence of work of this sort, the selling price of rebuilt motors is far below the cost of new machines of the same horsepower and make.

Kyanize Spar Finish

The Boston Varnish Co., of Boston, Mass., has had an unusually successful year in domestic and foreign business, and is now making regular shipments to the British West Indies, Russia, Australia, Spain, Cuba and other foreign countries. One of the preparations put out by this concern which is particularly popular is Kyanize Spar Finish. It is a water-proof varnish which will remain in water for weeks without turning white, and which is very durable. Kyanize White Enamel is another product of this concern that is strongly recommended for motor boat and general marine work. It is declared to cover more surface than the ordinary enamel and to flow out freely so that large panels can be done without showing brush marks. It also is durable, and will stand outside exposure without cracking or peeling. It is put up in a distinctive square bucket that is entirely different from any other container that has been used for white enamel and is thus readily recognizable. The Spar Finish is sold in triangular cans.

Crockett Varnishes

In 1868, nearly half a century ago, David B. Crockett began the manufacture of marine varnishes and, according to the officials of the present David B. Crockett Co., of Bridgeport, Conn., the intervening years have been ones of constant progress and increasing experience in varnish making. The original factory was located in New Haven, Conn., but when this plant became too small the company purchased a large tract of land from P. T. Barnum at the west end of Bridgeport and erected a large factory with ample accommodations for storing and boiling oils, melting gums, packing and shipping and storing finished varnishes. The most modern and scientific methods of manufacture are now in vogue in this plant. The finest imported gums and best oils procurable are used in the preparation of all Crockett products, and great care is given to all the details of manufacture.

Spar Composition, the Crockett varnish for marine work, has been standard with the yachting trade for many years, while No. 1 Preservative is declared to be without equal for interior finish. Water-proof Floor Finish for finishing floors and yacht cabins is a tough and elastic varnish which will stand the severest wear and tear. In addition to these products, the company has responded to a demand for a quick-drying popular-priced spar varnish for hurried work, and has produced the following: Spar Finish Outside, Spar Finish Inside and Spar One-Coat Finish. Another recent introduction to the marine trade is Crockett's Yacht Black. With the increased interest and enthusiasm in the boating world, the Crockett company looks forward to a very large marine trade in 1917.

Carpenter Products

From an unusually complete line of marine articles Geo. B. Carpenter & Co., of Chicago, Ill., especially recommend their Kainer Steerer, which, it is declared, has been a success beyond expectation. These steerers have been installed in every conceivable type of boat, including Disturber IV, commercial boats and cruisers of all sizes. It is said that when one of these steering gears is installed troubles are eliminated, for it has a positive action locking the rudder in all positions and overcoming all play and back-lash.

The Carpenter searchlight control, another specialty with this concern, gives absolute control of the searchlight in all positions, governing the up and down and side action from the bulkhead. It can be used with any make of cabin searchlight and is especially suitable for runabouts. The new Carpenter electric searchlight is made either in the cabin type for use with this control or in the deck type. The light is made of solid bronze throughout, and the wiring is concealed within the fork. By giving a half turn and raising it, the searchlight may be removed from the deck, this action also breaking the connection. The Carpenter people also make a set of very fine electric running lights for the three classes of motor boats. These are made of cast bronze, are small and compact and are furnished for any type of boat desired. An addition to their line is a cast bronze combination light. All of these products make suitable trimming for the better types of modern boats.

Liquid Veneer

A preparation offered by the Buffalo Specialty Co., of Buffalo, N. Y., which is of particular interest to the marine world, is Liquid Veneer. This is a polish and cleaner of almost universal possibilities. Applied occasionally on the woodwork and fittings of a new motor boat, it is declared to prevent the new look from wearing away, while cabin interiors which have grown dull and lifeless from lack of attention come out of a Liquid Veneer treatment with all the beauty of the grain brought out. This product is described as a surface food that really feeds and renews as well as carries off the dirt in a most efficient manner. Liquid Veneer is non-inflammable and non-explosive, and when applied leaves no oily film, but dries instantly. It may be used with good effect not only on the brightwork of a boat, but on its furniture, nickel, brass and copper.

Lobee Pumps

The Lobee Pump & Machinery Co., of Buffalo, N. Y., needs no introduction to the trade, as its pumps are known from coast to coast and in all parts of the world. This concern is declared to have been the pioneer in the manufacture of circulating and bilge pumps for the marine trade, and the success which it has achieved speaks volumes. It is a well-known fact that the efficient lubrication of high-speed motors is one of the most serious difficulties that engineers have to contend with, but racing boats equipped with Lobee pumps have in many cases won world records which may be traced to the reliability of their pumps and the consequent efficient circulation under the most trying strain. The manufacturers state that these pumps are well made and are not cheap in any respect, but are built to stand the severest tests of racing or endurance.

Dyson Standard Screw Propellers

For a number of years the American Manganese Bronze Co., of Holmesburg, Pa., has been manufacturing large quantities of its Spare's manganese bronze, and has always been interested in propellers. Recently it secured the services of Capt. C. W. Dyson, U. S. N., propeller expert of considerable renown, who agreed to design a set of standard propellers which will efficiently meet all general conditions found in motor boats. It was also agreed that these propellers should bear his name and should be of the highest grade of Spare's manganese bronze. The idea of the American Manganese Bronze Co., in bringing out the Dyson standard screw propellers was, therefore, to give the motor boating public the finest and most efficient propellers possible both as to design and construction. Three models have been selected which give a wide range of choice and make it possible to select a propeller for every standard condition, whether for light pleasure yachts, for heavy work or for fishing boats. The material used is a bronze which is exceedingly tough, strong, elastic and non-corrosive. The Dyson propeller idea embraces more than the finished product, as a special service bureau has been established for the purpose of making recommendations regarding the proper size and type of propeller for any boat, providing accurate data is submitted.

Champion Spark Plugs

The Champion Spark Plug Co., of Toledo, O., manufactures a very complete line of plugs for every type of motor. While some of them are especially adapted to motors of high speed and high compression and others to heavy, slow-turning engines, all have the feature of high efficiency in design and construction. One of the plugs manufactured by this concern is the Champion Magneto, which has closed end, conical porcelain and platinum point. It is designed to give extra long service and high efficiency with the magneto, and is especially adapted to oily motors, the claim being made that it absolutely will not foul from oil. The Champion one-piece heavy stone plug is especially made for motors of high power and compression. Extra heavy materials are used throughout and the plug is stated to be absolutely compression tight. The Champion priming plug has a key lock attached to the needle valve for easy opening and closing. It is so designed that the gasoline flows right to the sparking point. The Champion Heavy-Duty is a dollar plug of one-piece construction which is designed for large heavy-duty motors. The other three plugs mentioned are listed at \$1.25 each and all are made in the half-inch and metric threads.

(Continued on page 84)

CARBON

Remove it
Yourself
for

25[¢]

JOHNSON'S CARBON REMOVER

YOU can't expect engine efficiency or fuel economy if your cylinders are allowed to cake up with carbon. It overheats and pitts the valves, pre-ignites the gas, pounds out the bearings and clogs the piston rings so that compression is lost and power diminished. No wonder an engine gets weak and troublesome toward the end of a season.

But don't have your engine overhauled this winter—at least, not until you have tried this. Clean out the carbon, tune up the adjustments, and unless you have some loose bearings, you will find overhauling an unnecessary expense.

Johnson's Carbon Remover is the latest and most perfect solution of the carbon problem. It is easy to use, inexpensive and absolutely harmless. It will save you twenty times its cost every time you use it.

You Can Do This Yourself

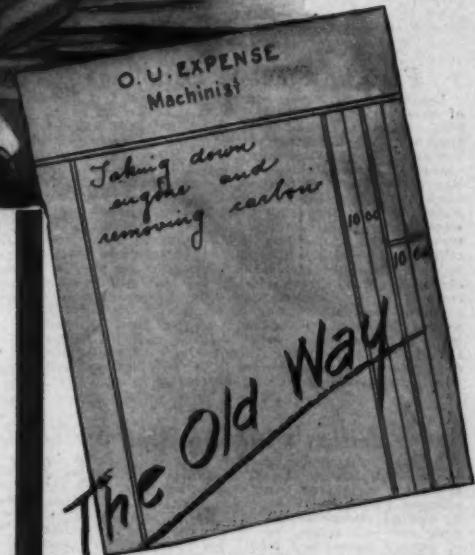
Pour an ounce or two of Johnson's Carbon Remover into each cylinder at night, it will dissolve the hard, gummy binder which holds the carbon together. In the morning, run your engine a few minutes and the carbon will blow out through the exhaust.

Johnson's Carbon Remover will cut down your gasoline consumption 12% to 25%. This is not merely a claim—it has been demonstrated on hundreds of motors.

Absolutely Guaranteed

We absolutely guarantee that Johnson's Carbon Remover cannot harm the motor, no matter how it is used. It doesn't affect the lubrication or interfere with the oil in the crank case. No acids.

**S. C. Johnson & Son, Dept. M. B.
Racine, Wis.**



**Get It From
Your Dealer**

or

**Send the
Coupon
Today**

S. C. JOHNSON & SON,
Dept. MB., Racine, Wis.

Gentlemen:—

I enclose \$1.00 for which please send me by prepaid express enough Johnson's Guaranteed Carbon Remover for cleaning an ordinary four cylinder engine three times.

Name

Address

City & State

My Dealer is

• Nineteen-Seventeen Equipment & Accessories for Motor Boats •

(Continued from page 82)

Stewart Carburetors

Carburetor trouble, when it occurs, is a thing which robs motor boating of a great deal of its pleasure, but trouble of this sort need not be experienced if proper foresight is devoted to the selection of a good instrument and its adjustments. The Detroit Lubricator Co., of Detroit, Mich., asserts that its Stewart carburetor is preeminently adapted for the exacting type of work necessitated by marine service. The danger of the motor backfiring through a carburetor should be non-existent on motor boats, and as the Stewart carburetor takes all its air through one port, it is declared that there is no possibility of a backfire occurring. Any tendency on the part of the motor to fire into the intake manifold causes the metering valve (a feature peculiar to the Stewart) to recede in its seat, momentarily cutting off the supply of gasoline and air. This carburetor is supplied with a dash control of the push-pull type. By pulling up on the control, the metering pin which governs the gasoline supply according to its position, is lowered in the carburetor, thereby enriching the mixture to facilitate starting. After the motor has become well warmed up, the pin, by means of the control, can be moved back to its former position, thus retaining the adjustment as originally fixed.

Lipman Pumps

The Lipman Mfg. Co., of Beloit, Wis., which manufactures centrifugal, gear and vane pumps, and other marine accessories, has had a very successful year and has been running its factory day and night for several months. Specialties with this concern are rotary, water and oil circulating pumps in aluminum, brass and iron, and it is stated that there are over 300,000 Lipman pumps in use in all parts of the world.

Francke Flexible Couplings

During the 1917 season the Smith-Serrell Co., Inc., of New York City, will offer its Francke flexible motor boat couplings for all sizes of motor boat engines from the small kicker up to the high-powered machine for racing boats and cruisers. The experience of five years will be used by the company for the determination of the likely shaft sizes in demand, and heavy stock will be laid in before spring to cover the expected sizes. Due to the great range in the various shaft sizes this previous experience is of great value to the manufacturers in enabling them to meet the customer's requirements quickly from stock. Increases in manufacturing facilities also make it possible for the purchaser to get with reasonable promptness any size not covered by the regular stock line. Details of this coupling are well known; it consists of merely two flanges connected by flexible laminated pins, the unit being provided with a special bolt through the center that holds the coupling together and transmits the push or pull of the propeller from the propeller shaft to the regular engine thrust bearing.

Jeffery's Marine Glue

Jeffery's water-proof marine glue is prepared by L. W. Ferdinand & Co., of Boston, Mass., in several kinds for various purposes which, however, have the common properties of flexibility, durability, insolubility and adhesiveness. Nos. 1, 2, 3 and 4 are used for deck and hull seams, No. 6 for coating the interior of battery boxes, and No. 7 for covering boats and decks with canvas. An interesting testimonial has been sent us by the Ferdinand company. It appears that the owner of a canvas-covered, lap-streaked row boat has written the company that his father applied the canvas cover in 1892, laying it in Jeffery's No. 7 black marine glue. Although the boat is of the clinker type, the glue has held ever since it was put on and the boat is still in constant service. It has been re-rigged and fitted with a new gunwale, but, according to the owner, the hull is as good as it ever was and has never leaked a drop. It has been in service from two to four months every year and has always been pulled up on a beach, thus subjecting the canvas to unusual wear.

Prest-O-Lite Boat Lighting

The Prest-O-Lite Co., Inc., of Indianapolis, Ind., puts out a lighting system which furnishes pure ready-to-use acetylene conveniently stored and controlled in the familiar seamless steel cylinder. The installation of Prest-O-Lite lighting equipment is simple, involving nothing that an ordinary mechanic cannot easily do. In boats of less than 50-foot length the piping throughout should be of $\frac{1}{4}$ -inch galvanized iron, and in larger boats $\frac{1}{4}$ -inch iron pipe should be used for the main trunk line, with the $\frac{1}{4}$ -inch piping for the branch lines leading to the fixtures. Ordinary city gas fixtures may be used for the interior lights, while the running lights may be easily adapted to the use of acetylene without losing their quality of being easily detachable. The Prest-O-Lite Company recently introduced a one-burner acetylene stove which has been found very satisfactory for use on motor boats and in camping parties, and the concern is also featuring its Prest-O-Lite storage battery, which is made in the standard voltages and capacities.

Splidorf Spark Plugs

Splidorf spark plugs have gained an enviable recognition in the world's ignition field, and a fitting testimonial to their excellence was in the award of a silver medal at the recent Panama-Pacific Exposition. This was the highest award given in the class. Splidorf plugs are made by the Splidorf Electrical Co., of Newark, N. J., in more than a dozen types for every kind of internal combustion motor. A distinguishing characteristic of the Splidorf plug is the hexagonal green jacket, but although it identifies the article, the presence of this jacket is not vital to the insulating efficiency of the plug, as the mica core, which is a feature of its design, takes care of that necessity. In the construction of this make of plug nothing is left to guesswork or haphazard methods, and the finished article is stated to be absolutely proof against the leakage of oil or compression, and be capable of standing up under the hardest continuous service.

Trimount Pumps

The Trimount Rotary Power Co., of Boston, Mass., states that the great demand for its Trimount rotary hand bilge pumps is pretty good evidence that the virtues of these pumps are becoming widely known. They are made entirely of a heavy durable bronze composition and have no weak parts, being solidly built. Great care is taken that every pump shall be in perfect working order before it leaves the factory. The suction lift and forcing qualities of the Trimount pump command them to the attention of builders, architects and owners alike.

The Still Arctic Silencer

This is an exhaust silencer manufactured by the Tracy-Still Mfg. Co., of Patchogue, N. Y., which is declared not to muffle, but actually to silence the exhaust of the gasoline engine. The manufacturers declare that it imposes no pressure on the motor, while in a recent test of a Still-equipped boat which was moored to a wharf, the engine actually developed more power with the silencer than when exhausting freely into the atmosphere. A feature of the silencer is that the under-water connection is short and can be a size smaller than the inlet. The atmospheric pipe line is never over one inch in diameter, and it usually discharges at the stern. No temperature greater than that of the circulating water discharge is found in this silencer, and for this reason the piping will last indefinitely. The makers state that the silencer itself should last as long as the engine jacket, as it is made of the same material throughout.

Thermex Silencer

This silencer is familiar to devotees of motor boating, as it has been on the market for several years. Being spherical in shape, it gives the greatest volume with the least surface. An element which enters largely into its success is the admission of water into the silencer, thereby reducing the temperature and causing a contraction of the exhaust gases. The

Thermex silencer is made in five sizes for engines up to 7-inch bore and stroke and is manufactured by the Thermex Silencer Works, of Boston, Mass.

H & N Carburetors

The H & N Carburetor Co., of N. Y. City, has announced a 1917 gasoline-kerosene carburetor which is declared to be a revelation in carburetion. This is a central draft instrument with dash pot, balanced floating air valve, and integral fuel metering pin which measures the exact quantity of air and fuel required by the motor at any speed and load. It is stated to be the only carburetor embodying a device for varying dash pot resistance, and in which the working vacuum can be regulated to suit exactly the particular motor to which it is attached. The design is such that all the incoming air travels in a single column, producing a perfectly homogeneous mixture, positively eliminating stratification and consequent loading. In operation, the engine is started on gasoline for the purpose of developing the exhaust heat to a point where it will vaporize the kerosene, and a valve is then opened to admit the kerosene. Being a duplex instrument, it is set to run at maximum efficiency without further adjustment. The H & N Duplex is a result of many years of research and experimentation, and was primarily designed for heavy work, such as is found in marine practice.

Supreme Auto Oil

The Gulf Refining Co., of Pittsburgh, Pa., is centering its attention at the present time on the selling of Supreme Auto Oil, a lubricant which is adapted to use in marine motors, no less than to their land counterparts. This oil is manufactured from southern base, asphalt crude oils which are stated to be superior to northern oils for the reason that they contain no paraffin. According to this company, the objection to paraffin in a lubricating oil is that it forms a sticky substance in the cylinders, which collects the carbon and allows it to harden. Another point claimed for Supreme oil is that it flows freely in zero weather. Furthermore, it contains no foreign matter that might be detrimental to the engine, and it is manufactured with the desire to make the very best lubricant possible, being sold under the guarantee that it is as good as the manufacturer claims it to be.

American Screw Propellers

According to the American Screw Propeller Co., of Philadelphia, Pa., propeller wheels for yachts, cruisers, and other pleasure craft do not receive the careful consideration which should be given them. As an example, a boat owner selects a stock propeller of a certain type, diameter, and pitch, and, deeming it to be the best available for the existing conditions, he fits it to the boat. If this propeller does not give the desired results, another is tried, and so on, until possibly three to five wheels are used in order to arrive at the result desired, and even then it is often doubtful if the highest propulsive efficiency is obtained. On large craft, such as warships, liners, freighters, tankers, etc., the propeller is designed especially for the given hull, and is further intended to utilize the engine power with a maximum efficiency, thereby reducing cost of running expense. If the method used in fitting propellers to pleasure craft were applied to larger craft, the price of selecting the proper propellers would be prohibitive, on account of the cost of patterns, of metal used in the propeller, and the labor connected with machining and fitting.

Considering the above statements, motor boatmen would no doubt say, "We appreciate these facts, but how can they be remedied?" In answer to this, the American Propeller people make the statement that, "When a man builds a 50- or 75-foot pleasure craft he generally desires everything of the best, and most of all he is very particular about his engines. As high propulsive efficiency cannot be obtained on any craft unless the engines transmit their power to a properly-designed propeller, it would appear that the propeller should receive a great deal of careful attention. The only way to be sure of a properly designed propeller, therefore, is to have your designs made by the company which has designed propellers for a majority of the large shipyards in the United States—The American Screw Propeller Co."

CELLO WIRELESS ELECTRIC LIGHTING SYSTEM

In the Cello "Wire-Less" Systems, there are no wires above the deck to connect or get water soaked

1000 FEET AWAY FROM THE LIGHT

The CELLO Running Lights have no wires above the deck. Merely a flush socket on deck which is absolutely waterproof at all times. Work on either one dry battery or a 6-volt system.

Class 1—Side Lights \$7.50 pair

Class 3—Side Lights 10.00 pair

Class 1—Combination Light 7.50 each

Class 2—Bow Light 5.00 each

Class 1—Stern Light 7.50 each

Class 2—Stern Light 8.75 each

CAMPBELL CO.
266 Commercial St.
BOSTON, MASS.
Write today for complete catalog



"BULL-DOG" Reverse Gear

Reliability was our first thought in designing the Bull-Dog. The type of construction, the materials used, the margin of excess strength—all contribute to this end.

Adopted for standard equipment by a number of marine engine manufacturers, including Kermath Mfg. Co., Carson Motor Co., and others.

Four sizes. Iron or Aluminum Case. 1 to 64 H.P. per 100 R.P.M.

Write today for catalog with prices.

Kennedy Machine Co.
45 Fort St., East, Detroit, Mich.

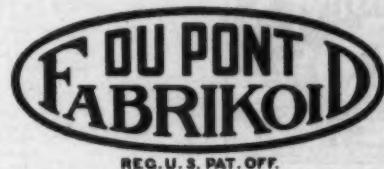
This gear will outlast your engine. It is smaller for its capacity, more compact, simpler, lighter in weight and more accessible than any other reverse gear.

Satisfaction guaranteed or money refunded.



Waterproof Boat Upholstery

EVERYTHING that efficient boat upholstery demands Fabrikoid supplies. It is handsome, luxurious, serviceable and stanch. It is proof against water, grease and the elements. It makes upholstery unsurpassed, cushions unrivaled and cabin coverings that are beyond anything you ever saw. In a word it is "supreme" for all kinds of artistic or useful purposes aboard ship.



looks and feels like the finest leather but it's *not* leather. It is made of a strongly woven cloth covered with a durable, waterproof, leather-like coating. Fresh or salt water will not affect it and because it is chemically inert it will not oxidize nor harden. For several years it has been used with success on the cushions and seats of many hundreds of thousands of motor cars. Today it is the "standardized" upholstery material, having proved its ability to withstand wear.

Rayntite Fabrikoid for Tops

is ideal for modern motor and speed boat tops. It is thoroughly waterproof, light in weight, strong in texture and handsome in appearance. Furthermore, it is sincerely guaranteed for one year against leakage.

Write for samples and full information.

Du Pont Fabrikoid Company
WILMINGTON : : : : DELAWARE

Works at Newburgh, N. Y.

Canadian Office and Factory:

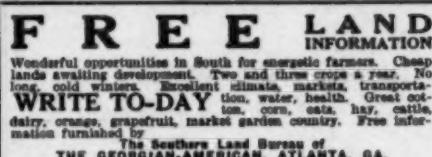
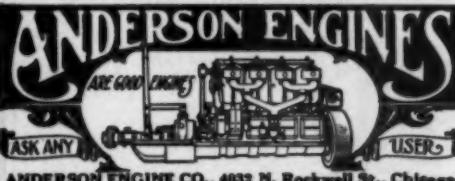
TORONTO





ABLE ENGINE

The Wonder of 1916. A high class four cycle engine, simpler and lighter than any other ever built.
Four Cylinder, 15 H.P.
With Reverse Gear, \$125. Weight, 150 lbs.
Without Reverse Gear, \$110. Weight, 150 lbs.
Including Splitter Dixie Magneto, Carburetor and Spark Plugs
Eight Cylinder V-Type, 30 H.P.
With Reverse Gear, \$250; Weight, 300 lbs.
Including 2 Splitter Dixie Magneto, Carburetor and Spark Plugs
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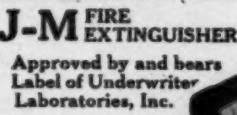


Something new in Motor Boat Tops and Equipment.
Send at once for our New Catalogue just out.
THE C. Z. KROH MFG. CO., TOLEDO, OHIO

U. S. P. S. Plan Winter's Work

(Continued from page 80)

20. Do tugs have to change lights when going from the ocean into the Hudson River?
21. What lights are shown on a vessel not under control? Give the day signal used in these circumstances.
- VI. 1. What is the fog signal for a steam vessel under way?
 - (a) When towing?
 - (b) When at anchor?
 - (c) Length of prolonged blast for steam vessels?
 - (d) Short blast for steam vessels?
2. What is the fog signal of a sail vessel on the starboard tack?
 - (a) On the port tack?
 - (b) Before the wind?
 - (c) At anchor?
3. Fog signals of vessel being towed?
4. Signal when engines are running astern?
5. Fog signals of rafts?
6. Of hand-power and horse-power craft?
- VII. When is risk of collision deemed to exist? Duties in case of collision?
- VIII. Rights of way.
 1. Right of way of sailing vessels, one close-hauled and one running free?
 2. Both close-hauled on different tacks? When is a boat on the starboard tack? Port tack?
 3. Both running free with wind on different sides?
 4. Both running free with wind on same side?
 5. Vessel running with wind aft?
- IX. 1. What is the rule for vessels meeting head and head?
2. Two vessels approaching, one of which does not understand the course or intention of the other. What signal?
3. What rule when approaching short bends with high banks?
4. When leaving berth?
5. What signals when desiring to pass when running in same direction?
 - (a) When to pass?
 - (b) Vessel ahead does not think it safe—what signal?
 - (c) When are passing signals not given?
- X. 1. Vessels crossing—which has the right of way, and what signal?
 - (a) In case of a steamer and a sailing vessel?
 - (b) When crossing and overtaking rules conflict, which prevails?
2. Vessels overtaking—which has the right of way?
3. Which side of fairway to be used in narrow channels?
4. Right of way between sail vessel under way and fishing vessels with lines and trawls out?
- XI. 1. What is danger signal?
 - (a) What should be done when hearing danger signal?
- XII. 1. Distress signal?
2. At night?
- XIII. 1. What is a fathom?
- XIV. 1. How allow for leeway?
2. Current?
- XV. 1. What is variation?
2. Deviation?
3. How do you change true to compass course?
4. Change to true course?
- XVI. 1. Explain cross bearings.
2. What is the doubling-the-angle-on-the-hoe method? Danger angle? Danger bearing?
- XVII. 1. Log.
2. Lead? How marked?
3. Arming lead?
- XVIII. Kinds of arrows for different currents?
- XIX. 1. Describe kinds of lights and lighthouses.
2. How numbered?
- (a) Buoy?
- (b) Spar: Meaning of red, red and black horizontal; white and black vertical; white and black horizontal; white, black?
- (c) Color and shape of nun?
- (d) Color and shape of can?
- (e) What do perches with balls, caged, etc., indicate?
- XX. 1. Where is club burgee located?
2. Ensign?
3. Private signal?
4. Officers' flag?
5. What flags on starboard yard arm?
6. What on port yard arm?
7. Where and when is the Union Jack flown?
8. How is a salute given, and when?
9. Is it proper to fly more than one flag on one hoist?
10. When should the flags be raised?
11. When should the flags be taken down?
12. Which flag should be the first raised, and the last lowered?
- What is a knot?
- Describe method of determining a compass course from one point to another upon a chart.
- XXI. 1. Box compass on points and quarter points.
2. Name cardinal and intercardinal points.
3. Number of degrees and how placed on compass.
4. Describe a pelorus, and what are its uses?
- XXII. Motor boat equipment, Classes 1, 2 and 3.
- XXIII. 1. Box compass on points and quarter points.
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- XXIV. Motor boat equipment, Classes 1, 2 and 3.



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"THE MOTOR THAT MOTES"
Two-Cycle, Non-Backfiring Models.
Four-Cycle Heavy Duty Motors.
Kerosene or Gasoline Styles.
3 1/2 to 48 H.P.
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LOWEST PRICE BOAT IN THE WORLD

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for 15-foot boat finished ready to run, with either inboard or outboard motor.
\$25 for complete k. d. boat—oak frame—express packing.
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The Choice of 25,000 Motorboat Owners
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Model A... 24.00 Model F... 30.00
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KENYON BOAT TOP

Made to order at reasonable prices to fit your boat. Light, flexible, strong material—fold easily and quickly on frame of rustless, enameled steel tubing. Perfect fit guaranteed. Write today for catalog.

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Dependable Fittings

Whistle outfit, Mufflers, Muffler Cut-outs, Filters, Fog bells, Stair locks, Combination flag pole and electric aft lights, Spark, throttle and reverse controls, etc.

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Builder of high grade 20 and 24 foot V Bottom boats
MOTOR BOAT LANE
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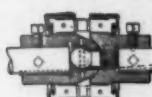
MISALIGNMENT FRICTION ELIMINATED

WITH A FRANCKE FLEXIBLE COUPLING

Takes Care of Thrust

When going "ahead" the thrust is transmitted by the propeller shaft, through the central bolt, without putting any strain on the flexible pins. When going "astern" the central bolt takes the pull of the propeller.

Install it Just Like a Rigid Coupling



No Extra Thrust Bearing
No Leaky Stuffing Boxes
Easier to Install Engines



When rigid couplings are used misalignment will bind the shafts in the bearings. Leaky stuffing boxes often result. Bearings heat and wear. Shafts break. The engine does not develop maximum revolutions. Eliminate the misalignment friction and you cure most of your troubles.

On fine boats, particularly speed types, the installation of a Francke flexible coupling between the reverse gear and propeller shaft allows each shaft to run freely on its own center. It prevents trouble—eliminates friction.

ALL METAL — ANY SIZE — ANY POWER — ANY SPEED

Read what BOWES & MOWER think of them

Smith-Serrell Co., Inc., New York.

Gentlemen:—Your telegram was received but it has been unanswered as the writer was out of town yesterday. The following boats of our design have been equipped with Francke couplings.

"DREAM"	Chas. Lagen	40' Ocean Racer	1 3-Cyl. 6 x 8	Standard	10 Miles
"DANEVA II"	Henry Strecke	38' Exp. Cruiser	1 6-Cyl. 5 1/2 x 6	Sterling	21 Miles
"ENCHANTRESS I"	Louis Burk	46' Exp. Cruiser	1 6-Cyl. 7 1/2 x 8 1/2	Loew-Victor	27 Miles
"ENCHANTRESS II"	Louis Burk	74' Exp. Cruiser	2 6-Cyl. 7 1/2 x 8 1/2	Loew-Victor	23 Miles
"BABY ENCHANTRESS"	Louis Burk	49' Exp. Cruiser	1 8-Cyl. 5 1/2 x 6	Van Blerck	22 Miles
"ACE"	G. W. C. Drexel	48' Runabout	2 8-Cyl. 5 1/2 x 7	Wisconsin	35 Miles
"AKBAR"	G. W. C. Drexel	73' Exp. Cruiser	2 6-Cyl. 7 1/2 x 8 1/2	Loew-Victor	25 Miles
"LADY BALTIMORE"	Hall Seeley	77' Ocean Racer	1 6-Cyl. 6 1/2 x 12	Hall-Seeley	13 Miles
"ADIOS II"	L. L. Biddle	56' Runabout	2 6-Cyl. 6 1/2 x 7 1/2	Duesenberg	40 Miles
"AMEERA"	Alex. Sellers	71' Exp. Cruiser	2 6-Cyl. 6 1/2 x 7 1/2	Duesenberg	26 Miles
SCOUT PATROL	Chas. Longstreth	73' Exp. Cruiser	2 8-Cyl. 6 1/2 x 7 1/2	Duesenberg	30 Miles
BUILDING	S. L. Avery	66' Exp. Cruiser	1 8-Cyl. 6 1/2 x 7 1/2	Duesenberg	
BUILDING	L. Eisenlohr	51' Exp. Cruiser	2 6-Cyl. 6 x 6	Van Blerck	22 Miles

As you will see from the above list practically all of our express cruisers have been equipped with Francke Flexible Couplings and have given us excellent service. As a matter of fact we have never had a complaint of any kind from a Francke Coupling installed in any of our power boats. We are specifying them in all of our high speed work and consider them equally desirable for cruisers of moderate speed. We are also pleased to say that the service which your company has rendered has always been extremely satisfactory.

Yours very truly,

BOWES & MOWER.

(Signed) C. D. Mower.

Send your H. P., R. P. M., Shaft and Keyway Sizes to

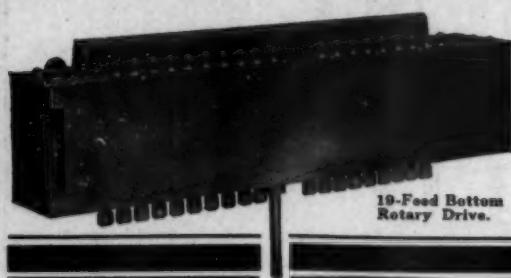
Smith-Serrell Co., Inc.

General Sales Agent for The Francke Co.

West Street Bldg.

New York City

Manzel Force-Feed Oilers



Provide
Unfailing
Lubrication

Engine Manufacturers



—and Owners Too

YOU can't expect to have a smooth - running, cleanly, reliable and durable engine if you depend upon a lubricating system that fails to supply the exact amount of oil required, at the right time and the right place.

Manzel Force-Feed Oilers

supply the highest possible degree of reliability in marine engine lubrication. They force the oil to the bearings and cylinders in exact proportion to the engine speed.

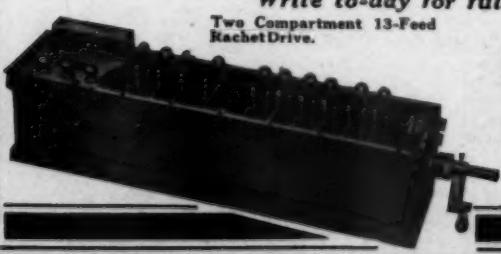
Manzel Oilers will handle heavy or light oil and will pump against any pressure. They may be run in either direction and at any speed. They are made with any number of feeds from one to fifty, with either pulley or ratchet drive, and can be supplied with the drive in any position desired. The feeds can be adjusted to supply the exact amount of oil required at each point to be lubricated, each feed being adjusted independently. If desired we can furnish with two compartments for feeding two kinds of oil.

Manzel Pumps save oil, reduce repairs and prolong the life of the motors on which they are used.

**Specify a Manzel Oiler when you order
your new engine**

Write to-day for full information

Two Compartment 13-Feed
Ratchet Drive.



MANZEL BROS. CO.

295-297 Babcock St., Buffalo, N. Y.

San Francisco Office, 356 Market St.

THIS issue of MOTOR Boating goes to press with a gain of 15,120 agate lines of advertising over the issue of last December. This increase of more than 40% proves the prosperous condition of the marine industry. Make 1917 your record year. Advertise!



HATCH
Kerosene Oil
Engines
Marine
Stationary
Portable

NO GASOLINE, NO DANGER. Maximum Power, Lightest Weight. Simple, Reliable, Economical. No batteries. Self Ignition by Compression. Fully guaranteed. Write for Catalogue M. Crude, Fuel or Kerosene Oil.

INGRAM-HATCH MOTOR CORP.
2 & 4 Stone Street
New York

**HAVE
ELECTRIC
LIGHTS**

Carleton Generator
Especially adapted for marine service. Fully enclosed. Rated at 7.5 volts and amperes. Driven by the engine and keeps any battery charged, furnishing current for ignition and for all lights, whether running or at anchor. Easily installed.

Special 12-volt, 10-ampere Generators. Also Governors, Automatic Cut-outs, Ammeters and Storage Batteries. Write today for Bulletin.

Attractive dealers' proposition.

The Carleton Company
186 Summer Street
Boston, Mass.



Practical Wireless for Motor Boats

(Continued from page 14)

far the most satisfactory and the cheapest in actual service. An induction coil calls for a heavy supply of current from the battery, so that in the case of dry cells the battery is soon exhausted and must be renewed. Not only is this expensive, but it is highly inconvenient, since it often happens that the cells become so weakened after a short period of use that the efficiency of the transmitter is seriously affected. On the other hand, the current supply from a storage battery is practically constant; and when the cells reach the limit of discharge, they can be recharged at a moderate rate—certainly at a price which more than compares favorably with new dry cells.

It is possible that the motor boat owner of an ingenious turn of mind may care to install a low-voltage generator of an output of between 8 and 14 volts, and 2 to 5 amperes, for furnishing current to the induction coil. While such a generator will have the disadvantage of being unable to furnish current while the engine of the boat is at rest—it being taken for granted that the generator is driven by the boat's engine—this can be eliminated if desired by also including a storage battery which normally stores up current for use when the engine is not in use. Then again, the wireless transmitter may perhaps be operated from the low-voltage lighting circuit of the motor boat.

The apparatus which has been mentioned may be secured either in the form of separate instruments, so that the purchaser can arrange them to suit his convenience and dictates, or as a complete set, mounted in a cabinet or on a panel. For simplicity's and workability's sake, the latter is recommended, although it is true that the complete sets average somewhat higher than the separate pieces of apparatus making up a set of equal efficiency.

So much for the transmitters for small craft. For motor boats accommodating an aerial of upwards of 30 feet, the transmitter may be of a more elaborate and higher powered type. For aerials up to 50 feet the apparatus should consist of a tuning inductance, a condenser, a rotary spark gap, a spark coil of over three-inch rating or a transformer, a telegraph key, and a suitable current supply. If the available space on board the boat does not permit the installation of a small motor-generator to operate from the 110-volt lighting circuit, or a small alternator driven from the boat engine in the absence of such a lighting circuit, then the choice is limited to a dry battery or storage battery as in the case of the smaller boats, and an induction coil. But should there be space on board and a current supply available for a small motor-generator set, then by all means a small transformer should be included in the set. Depending upon the capacity of the aerial, the transformer should be of $\frac{1}{2}$, $\frac{1}{4}$, or $\frac{1}{2}$ k.w. capacity. The apparatus can be secured either as separate pieces or in the form of complete sets.

On boats where the aerial is longer than 50 feet, the apparatus should be the same as that just mentioned, with the exception that the transformer is to be of a higher rating, depending upon the capacity of the aerial. Of course, with the employment of more powerful apparatus, many auxiliary pieces of apparatus are necessary, such as protective devices, meters, anchor gaps, etc., which are recommended by the manufacturer of the apparatus selected. It is especially in the case of powerful apparatus for the larger motor boats that the complete sets should be given the preference, for the installation of such apparatus calls for considerable experience if purchased as separate instruments.

If the motor boat owner has chosen to purchase his transmitting apparatus as separate instruments, he can install them much in the same manner as the receiving apparatus. The ideal arrangement, as was described in a previous issue in connection with receiving apparatus, is to mount the instruments in a substantial wooden case of a size sufficient to hold the receiving set as well, and provided with a drop front which forms a table for the operator. A simpler arrangement is to mount the instruments on a table or shelf, although they then take up more room and are not protected against dust and moisture when not in use. Still another method, and one very much in favor at the present moment, is to mount the transmitting instruments on the back of a panel, with only the operating knobs and switches, and possibly the spark gap, coming through or mounted on the front surface. This is a neat arrangement, and highly convenient. It is, of course, independent of the receiving set.

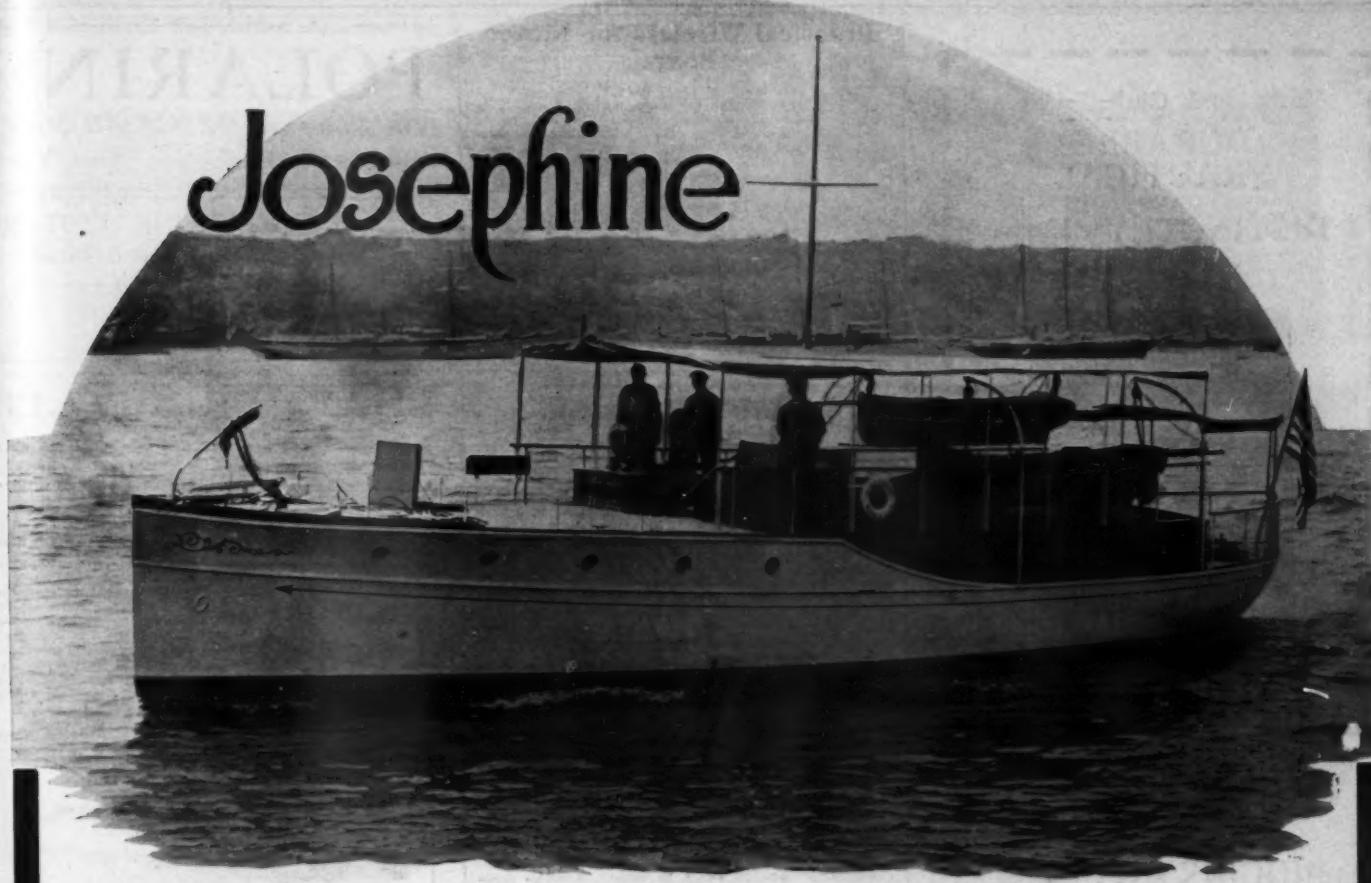
In installing transmitting apparatus, the insulation of the high tension leads of the wave-generating circuit should be the very best, if leakage and a consequent loss of efficiency are to be avoided. Because of wavelength considerations, which will be covered fully in the next instalment, the connections between instruments in the wave-generating circuit should be as short as practicable, and made with copper strip if possible. If these strips must be supported the support should be a suitable form of insulator. Wherever feasible, however, the strips should be supported entirely by the instruments so that no insulator supports are necessary; air, after all, is the best insulator for this purpose. The tuning of the transmitter is a simple procedure when once explained, and this, too, is reserved for the next instalment.

Unprecedented progress made during the past year or two in the field of radio telephony has brought into existence a simple wireless telephone set applicable to even the small motor boat equipped with a fair-sized aerial. And the obvious advantages of being able to converse with another station in the usual manner instead of resorting to the use of a telegraph code, make the wireless telephone of immediate interest to the motor boat owner who does not care to delve into the interesting and fascinating hobby of operating the usual wireless set. Then there is the matter of expediency, for with the wireless telephone from five to ten times as many words per minute can be transmitted as with the wireless telegraph, by anyone without previous experience. In fact, the main advantage of the wireless telephone is the elimination of the trained operator.

The present wireless telephone has eliminated the arc and other features which formed the obstacles toward the commercial development of this means of communication in its pioneer days. The generator of the high frequency currents is a modification of the now famous de Forest audion which has proved so popular as a detector in receiving sets. A typical wireless telephone for motor boats is mounted on a panel of insulating material measuring 11 x 13 inches, including the oscillation bulb or tube, potentiometer for

(Continued on page 90)

Josephine



"A 20th Century Boat"

JOSEPHINE is a sixty foot seagoing cruiser which we delivered last summer to Mr. A. H. Bromell, of Munson Steamship Line, New York. Generally conceded to be one of the finest motor yachts produced during 1916, we offer this boat as a typical example of the work turned out by this company. Powered with one of our six cylinder 65-75 h. p. 20th Century Motors.

If you want a fine yacht, cruiser, houseboat, or a smaller boat, we invite you to investigate our facilities for designing and building the kind of a boat you want. Let us show you our plant and equipment here in New York; let us refer you to some of the recent boats we have produced; let us submit estimates or sketches incorporating your ideas or requirements.

We also build the celebrated 20th Century Four Cycle Motors in three models, rated at 15-20 h. p., 40-50 h. p. and 65-75 h. p., respectively. The 20th Century Motors are built for gasoline or kerosene. Write for catalog.



Tanguingui—A 63 x 16-ft. houseboat built for Mr. J. C. McCoy, of Nayatt Point, R. I. Powered with two four-cylinder 20th Century Motors, of 40-50 h.p. each. Equipped for year-around service—in Florida in winter and in the North in summer.



20th Century Heavy Duty Four-Cycle Marine Motor.
2-Cylinder, 15-20 h.p.
4-Cylinder, 40-50 h.p.
6-Cylinder, 65-75 h.p.

New York Yacht, Launch & Engine Co.
Morris Heights, New York City

Yacht and Club Services
**DURABLE
 PRACTICAL
 AND
 DISTINCTLY
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CHINA AND GLASS

decorated with your private signals or colors.

It would be a pleasure to submit Sketches and Estimates.

Yacht Outfitting Department

HIGGINS & SEITER
 INC.
 FOUNDED 1887
 CHINA AND GLASS MERCHANTS
 9-11 EAST 37th STREET
 NEW YORK CITY.

Solheim's Launch Works
GREAT KILLS, S. I.

Store your boat in a safe place, handy to the city. Rates reasonable. Building and repairing by competent workmen. All work guaranteed.

We have ready for shipment completed hulls, also semi-finished hulls from 16 ft. to 30 ft. We furnish knock-down frames and all parts for any size motor boat.

Designers a d builders of Launches, Cruisers, Auxiliary Yachts and Tenders. Write for prices and descriptions. ROBERTSON BROS. Foot of Bay St., Hamilton, Can.



PUMPS

Made by the

Lipman Mfg. Co.
 for circulating purposes are the very best. Hundreds of Thousands in use. Send for Catalogue.

233 Pleasant St. Beloit, Wis.

Get a MOHAWK

It will prove the best engine investment you ever made.

S. & R. MFG. CO.
 Ingersoll Ave. Schenectady, N. Y.



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 Advertising Index will be found on page 60.

Practical Wireless for Motor Boats

(Continued from page 88)

close regulation, filament rheostat, impedance coils, loading inductance, telephone transformer coil, microphone transmitter of the adjustable arm type, fixed condenser, and minor accessories. With the set a battery delivering 150 to 300 volts is required, which may be composed of flashlight cells, or a motor-generator set which can be supplied with the set when it is to be used extensively. The filament of the oscillation wave-generator operates from a small storage battery. A variable condenser in oil is also needed and is connected to binding posts at the bottom of the panel.

It is claimed that the wireless telephone of this type has a range of from one to five miles, which is considered ample for motor boats. Furthermore, the set may be used as a wireless telegraph transmitter if desired, in which case the range is two or three times as great. The life of the oscillation bulb or tube when properly used is from 300 to 500 operating hours, which is equivalent to about a year's service. Because of its small size, the set can be installed in some odd corner of the motor boat.

For larger motor boats the wireless telephone is available in more elaborate and powerful types, with a range several times that of the smaller set. In either case the conversation transmitted by the wireless telephone may be heard by any station within range, using standard wireless telegraph apparatus.

Before closing this article, perhaps it is but proper to add a few words concerning transmitting radius of different sets. The reader will appreciate from what was said with regard to receiving apparatus that the distance that can be covered by either a receiving or a transmitting set is entirely problematical. It is impossible to make definite claims for any particular set before that set has been actually tried out under the very same conditions as those under which it is to be used. But the following broad figures, based on actual performance, may be considered as a conservative guide:

A transmitter using a one-inch induction coil, from three to five miles with an aerial fifteen to twenty-five feet long; using a two-inch coil with twenty to thirty-foot aerial, five to ten miles; using a three-inch coil with twenty-five to forty-foot aerial, ten to twenty miles. A transmitter using a $\frac{1}{2}$ -k.w. transformer with an aerial from thirty to forty feet long, fifteen to twenty-five miles; using $\frac{1}{4}$ -k.w. transformer with an aerial fifty feet long, twenty to thirty-five miles; using a $\frac{1}{2}$ -k.w. transformer with an aerial above fifty feet long, thirty to fifty or more miles.

Author's Note: It was stated in the November instalment that owing to recent patent litigation, the audion and audion receiving sets would not be obtainable for perhaps years to come. A letter from the manufacturers of the deForest audion and audion receiving sets has just been received, which in part reads as follows:

"While we are perfectly willing to admit that the patent litigation resulted in a decision unfavorable to ourselves, we have however appealed this decision, and pending the decision of this appeal we have a perfect right to manufacture and offer for sale audions and audion apparatus."

The 40-Mile Cruiser a Possibility

(Continued from page 16)

great degree, and to poor material to a lesser degree. Most of the engines contracted for April delivery did not arrive until August, and some of the April engines have not been tested yet, and when the engines built by the various firms for delivery late in the season did arrive they soon showed signs of weakness and had to be sent back to the factories in many cases. Lucky was the builder of last season who did not have the engine contract as part of his hull work. It seems very hard on the various owners who put thousands of dollars into these boats to have them tied to the docks waiting for machinery or being repaired and overhauled. It has taught the buying public of the larger motors a lesson it will not forget.

In the past some of the engine builders have looked on the selling and producing of larger marine motors as more of a game than a business. Their sales agents would make all kinds of promises that they did not keep. In the future the buying public will see that it has the proper kind of a contract, one that calls for liquidated damages for non-delivery on time and a bond covering the guarantees of the engine builder. The larger responsible companies will be only too glad to make such contracts as they know what they can do, while the irresponsible ones will hesitate as it would be a big loss to them if they did not make good. In this way the square, legitimate builder as well as the purchaser would be protected from the unscrupulous engine builder. What man would think of contracting for a five to twenty thousand-dollar house from a builder without a proper contract and bond? If this matter is not corrected, it is soon going to become a serious blow to the building of new boats. The engine builder does not trust the owner, and demands a payment on placing order, and the balance when the engine is delivered. If the owner then has not the proper kind of a contract, backed by a good bond, he may have an engine that will not do what it is supposed to do, and the engine company has his money and he has no way of obtaining redress.

With the experience the engine builders have gained this season, we can look for the finest crop of high-speed express cruiser engines for the 1917 season that can be produced. It was not due to the fact that their intentions were not good that they did not produce successful engines this season, but to the circumstances we were not trained to work to the close limits necessary in machining and assembling these high-grade pieces of machinery. This defect has been remedied in most of the factories, and wonderful results can soon be expected.

The developing of hulls suitable for express cruiser and express racing boats has become a rather complicated mathematical science, and for a firm of naval architects to turn out successful boats of these types it is necessary to make great use of the experimental model basin at Washington and the Navy Department has very kindly permitted this basin to be used by private firms when not busy on Government use. I have found the officers and men in charge extremely kind and helpful when my firm has been conducting experimental work in this basin. Credit

(Continued on page 92)

POLARINE

The Standard Oil For All Motor Standard Oil Co. of New York

STANLEY MARINE MOTOR

High in Quality—Low in Price

THE STANLEY CO.

SALEM, MASS.

Send for Catalog

SHAW PROPELLER

(Patented)

Scientifically designed to secure maximum thrust efficiency from every square inch of surface—and does it. Manganese bronze. Guaranteed.

Write for prices and guarantee

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A VOID disaster by using a DIRIGO compass on that boat. All materials first class. No rubber gaskets to rot. A very hard pivot and high-grade jewel. Navy degree circle on dial. Brass and mahogany binnacle. Also new course finder and bearings instrument. Send for descriptive catalog.

EUGENE M. SHERMAN
 Box 3 Bellevue, Wash.

OUR SPECIAL 25' x 5' 10" RUNABOUTS
 All sizes and types built. K. D. or complete.



Write **RICHARDSON BOAT CO.**, Sweeney St., No. TONAWANDA, N. Y.

MARINITE

Is particularly recommended where quick drying qualities are a first consideration. Dries dust free in three to five hours.

Will not turn white under water.

EDWARD SMITH & COMPANY

Varnish Makers for 88 Years

CHICAGO NEW YORK

Mason Machine Works
 Taunton, Mass.

New 1916 Model Marine Engines

MORTON

Cycle

New design with monoblock cylinders, $3\frac{1}{2}$ " x 4", overhead valves, etc. \$150
 16 H. P. at 1000 R. P. M.

MORTON MOTOR CO.
 46 E. Lafayette Ave., DETROIT, MICH.

MOTORGO

Four-Cylinder 14 H. P. at 750 R. P. M.
 Four Cylinders, $3\frac{1}{2}$ " x $4\frac{1}{2}$ ", Weight, 385 Lbs.

Speed range, 200 to 1,500 R. P. M.

Two-Cycle, $2\frac{1}{2}$ " to 8 H. P.

Write today for catalog 90M75 of Motorgo Engines. Reverse Gears and Equipment.

SEARS, ROEBUCK & CO. Chicago, Ill.

Mullins Steel Boats Can't Sink

When you think of buying a boat, whether it be a 16 foot Runabout, a big 36 foot Auto Boat, or something in between—remember that **Mullins Steel Boat Company** makes boats for you. They cannot sink, leak, water-log, dry out or open at the

THE W. H. MULLINS CO., 714 Franklin Street, Salem, Ohio

Pioneer Boat & Pattern Co.
 Wharf No. 81 Bay City, Mich.

Designers and Builders of Boats for Pleasure, Speed and Commercial Purposes.

COMPLETE OR IN THE KNOCK-DOWN

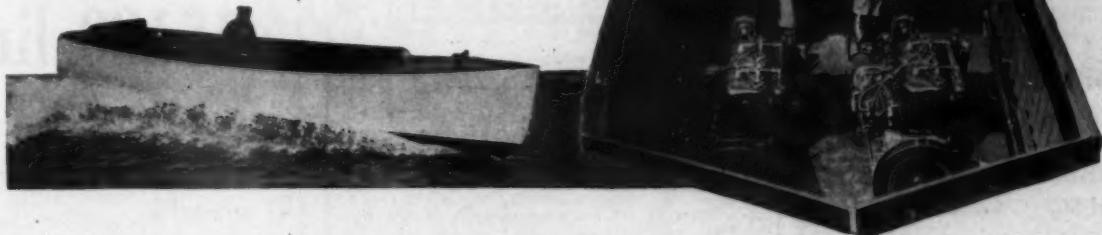
A Large Line V Bottoms

WRITE FOR CATALOG



Twin Screw Installations For Small Cruisers and Runabouts

These two Model "D" 20-24 H.P. Grays replaced one six cylinder 50 H.P. motor in this 30' x 5' 6" runabout. The twin motors weigh less and cost less than the single motor and produce one mile per hour more speed with less draft and less vibration.



¶A Gray twin-screw installation gives you better results for less money than a single engine of equal horsepower. By manufacturing Gray motors in quantities from twenty-five to fifty times greater than any marine engine company builds fifty horsepower machines, we can furnish two motors of the highest quality at a lower price than you can secure one good 50 horsepower engine.

¶Exhaustive tests have proved conclusively that the twin-screw outfit consumes less gasoline per mile than the single-screw installation. You are saving money every hour with a pair of model "D's."

¶Two separate units give you twice the engine reliability and exactly doubles your margin of safety.

¶A twin-screw power plant increases your speed range and is twice as flexible as a single engine.

¶You will find that twin-screw installation takes up less fore-and-aft room in your boat and provides a convenient center aisle.

¶Twin-screw outfits give you less vibration and greater speed.

¶Twin-screw outfits mean a saving in first cost, in operation, in reliability, in convenience, and in flexibility.

¶This has been the experience of the Gray Motor Co., world's largest exclusive manufacturers of two and four cycle marine and stationary engines.

¶A postcard request brings to you the full results of our twin-screw experiments.

"THERE'S A GRAY FOR EVERY BOAT"—
3 to 90 H.P.

GRAY MOTOR CO., 1274 Gray Motor Bldg., DETROIT, MICH.

REGAL

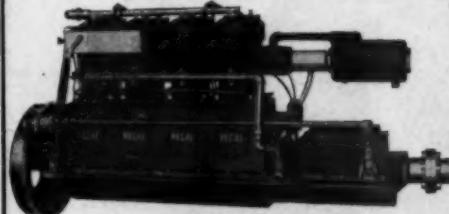
FOUR CYCLE ENGINES

For Gasoline or Kerosene

Regal Marine Engines have been on the market for 16 years. We have from the first devoted our attention to the production of four cycle engines that combine reliability and efficiency with reasonable prices.

Their design represents a standard of value and quality that is now recognized the world over.

Regal engines are built in different sizes and models suitable for all classes of boats from 14 ft. to 80 ft. in length.



50 H. P. Heavy Duty Engine

REGAL GASOLINE ENGINE CO.

74 W. Pearl St., Coldwater, Mich.

STONE MANUFACTURING COMPANY
L I Q U I D
TENOX
GASKET
 Also Manufacturers of Tenox Products
 138 LIBERTY STREET NEW YORK, N. Y.

Canoes, Rowboats and Fishboats \$18 and Up
 Rowboats and canoes for detachable motor. Motor boats and power boats 10 ft. to 20 ft. constantly in stock. Longer lengths made to order.
 Catalog FREE. All prices based on selling direct to the user. Please mention what kind of boat you are interested in.
 Thompson Bros. Boat Mfg. Co., 35 Ellis Ave., Pudding, Wis.

USE
TEXACO
 Gasoline and Motor Oils

The 40-Mile Cruiser a Possibility

(Continued from page 90)

for the research work that the experimental work in the basin is based upon must be given to Admiral Taylor, present Chief Constructor of the Navy.

Next season we shall see the new boats more sharply divided into classes. I believe that the new craft built will be of the following types: express cruisers, fast cruisers, motor houseboats and fast sea-going runabouts. The number of boats built in each class and the popularity of the classes I believe will be in the order I have named them. The reason for this can be quite readily understood. There are more men that have Saturday afternoon and Sunday with an occasional afternoon during the week free from business than there are those who can stay away from the office for several days at a time. To this class of men the express cruiser gives wonderful returns for the money invested. Instead of having a hard time getting out of sight of his mooring and back of an afternoon, as was the case with the old 8-to-10-mile boat, he can now cover 100 to 150 miles in the same time. This means that he will not be restricted to the same old trips every time he goes out, but can pick many points of interest to visit far from his home port.

The motor boat owners who have plenty of time for cruising will divide themselves into two classes—those that will build fast cruising boats, and those who go South in the winter and live on their boats a great many days in the year and will build houseboats, or as they have been more recently called, motor house yachts. I don't believe many will build the regular cruising motor boats with speed varying from 10 to 12 miles per hour. Such a man is certainly going to build a motor houseboat as he can get so much more return for his money in the way of comfort and accommodation, with very little sacrifice of speed in such a boat. There will always be the man who wishes to take long cruises and go regardless of the weather. Such a man will want a fast cruiser, and by this term I mean the offshore boat from 60 to 150 feet in length, capable of from 15 to 20 miles' speed. I expect to see a marked improvement in the method of propulsion in these two types of boats.

I also believe that the days of what is popularly known as the heavy-duty gasoline motor are about over. These motors will surely be replaced by the fast turning Diesel, the high-speed gasoline engine with reduction gears, and both high-speed gasoline and Diesel engines driving generators for electric propulsion. This last method of propulsion is certainly the ideal one from many points of view.

It will only be a short time before we have developed high-speed Diesel generating sets. A man can then install either one or two such sets in his fast cruiser or houseboat, and drive his twin screws with motors. These generating sets, no doubt, will be constant speed units, governor-controlled so that the engineer has nothing to do but start them, and keep them oiled, as the control of the motors would be on the bridge. A pair of rheostat controllers would take care of the motors driving the screws, so that the helmsman could get instant change of speed either ahead or astern on either screw as he might desire, the governor on the generating set taking care of the change of load. The advantages of two generating sets are many, one being that should you wish to cruise on half power you can do so with both screws going, and the second generating set held in reserve. The advantage of having both screws in operation over running one engine in a direct-coupled twin-screw outfit is, of course, apparent.

The fast sea-going runabouts will never be very plentiful, as they are expensive to build and maintain. I mean boats from 45 to 65 feet in length that will do from 35 to 45 miles per hour in a fair sea-way. Such of these boats as are built will have their passenger cockpits forward protected by glass windshields, and their machinery aft of amidships. This places the owner and his guests in the dryest part of this type of boat, and in such a position that the objectionable odor and noise of the motors is in back of them. Mr. Drexel's 35-miler Ace and Mr. Bidle's Adios II are two good examples of this type of boat.

Prompt Deliveries Certain for 1917

(Continued from page 37)

clearance, compression, timing, etc., to give the best results for specific services.

All marine engine manufacturers specialize in types to meet certain requirements, and motors are built also to different qualities to meet a price. Of course, in buying a low-priced motor, a man cannot expect to get with it all that goes with a motor of greater cost, either in equipment or workmanship. In the marine engine business as well as in a few other manufacturing lines one gets a dollar's value for every dollar expended, and in looking over the entire marine field, I do not think there is a case where a manufacturer is overcharging for his product. As a matter of fact, materials have soared so steadily in the last year that the manufacturer is obliged to content himself with a nominal profit, and the only alternative to price-raising has been quantity production.

I have said that deliveries of materials and parts have been delayed, and it may prove interesting to the reader to go a little more closely into this present phase of marine engine building, explaining just where the rub comes: The majority of the steel that enters into a motor's construction is drop-forged, and as different drop-forging companies specialize in certain forgings, the engine maker is obliged to distribute his work to many shops. Each part requires a special die, and the manufacturer has to place with the forge company an order for this die; in nearly all cases it then becomes the property of the forging people, as it is made for their special method and manner of doing the work.

It takes considerable time to make a die, and, once made, deliveries on drop-forging work average from four to six months and sometimes longer. When they are not forthcoming on the dates specified, there is little that the manufacturer can do, as he is unable to obtain the parts elsewhere without equally long delays. In many cases we have had dies made in two different plants and have duplicated orders. More than once, delayed shipments have come in, and, as an unfitting reward for our foresight, we have been overstocked.

(Continued on page 116)

THE COAST LINE TO MACKINAC
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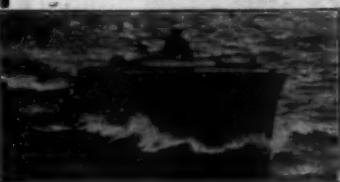
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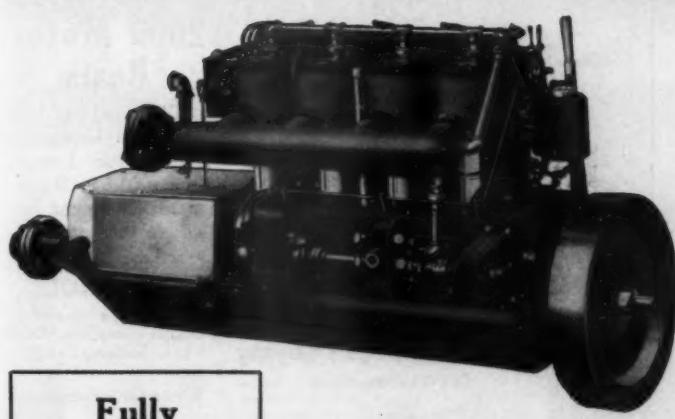
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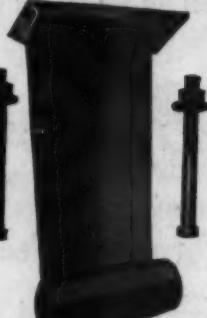
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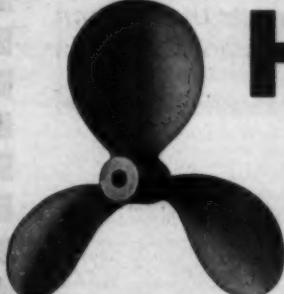
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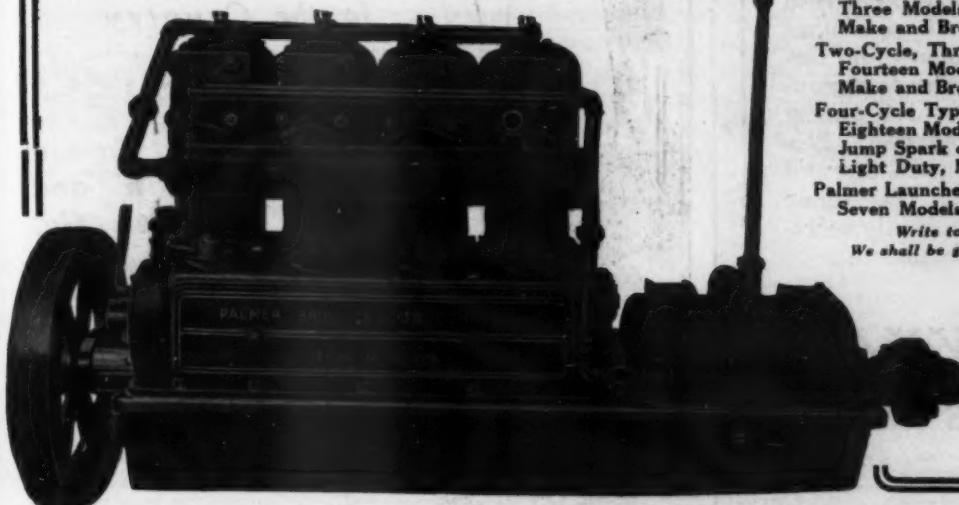
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30	H.P. Mitchell, 4 cyl., 4 cycle.....	300.00	180.00	120.00	12	H.P. Little Giant, 2 cyl., 2 cycle.....	185.00	125.00	100.00
Two 30	H.P. Wolverines, 3 cyl., 2 cycle, 7x9, each.....	225.00	220.00	200.00	10-12	H.P. Barber, 2 cyl., 2 cycle.....	120.00	75.00	60.00
25-40	H.P. H.F.P. motor truck engine, 4 cyl., 4 cycle 250.00	250.00	100.00	10	H.P. Racine, 2 cyl., 2 cycle.....	150.00	100.00	
25	H.P. Hubbard, 4 cyl., 4 cycle, 4x5.....	280.00	150.00	120.00	10	H.P. Tuttle, 2 cyl., 2 cycle.....	115.00	95.00	75.00
20	H.P. Fox, 3 cyl., 2 cycle.....	150.00	110.00	95.00	9-12	H.P. Fairbanks-Smalle, 3 cyl., 2 cycle.....	125.00	110.00	95.00
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15	H.P. Lindell, 3 cyl., 2 cycle, 5x5.....	135.00	100.00	85.00	8	H.P. Barker, 2 cyl., 2 cycle.....	100.00	60.00	50.00
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14	H.P. Heindl, 4 cyl., 4 cycle, 4x4½.....	275.00	200.00	150.00	7	H.P. Fairfield.....	75.00	45.00
12-16	H.P. Eddystone-Globe, 5½x5, 2 cyl., 2 cycle.....	225.00	150.00	125.00	6	H.P. Lackawanna, 2 cyl., 2 cycle.....	55.00	30.00
12-15	H.P. Pan, 4 cyl., 4 cycle, 3½x7½.....	180.00	110.00	75.00	6	H.P. Dutton, single cyl., 2 cycle.....	85.00	25.00
12	H.P. Detroit, 2 cyl., 2 cycle, 5 9/16x5.....	180.00	75.00	65.00	4	H.P. Dunn, 2 cyl., 4 cycle, 3½x5.....	80.00	40.00	35.00
12	H.P. Mianus, 2 cyl., 2 cycle, 5 9/16x5.....	185.00	150.00	2½ H.P. Barber	35.00	25.00	20.00	

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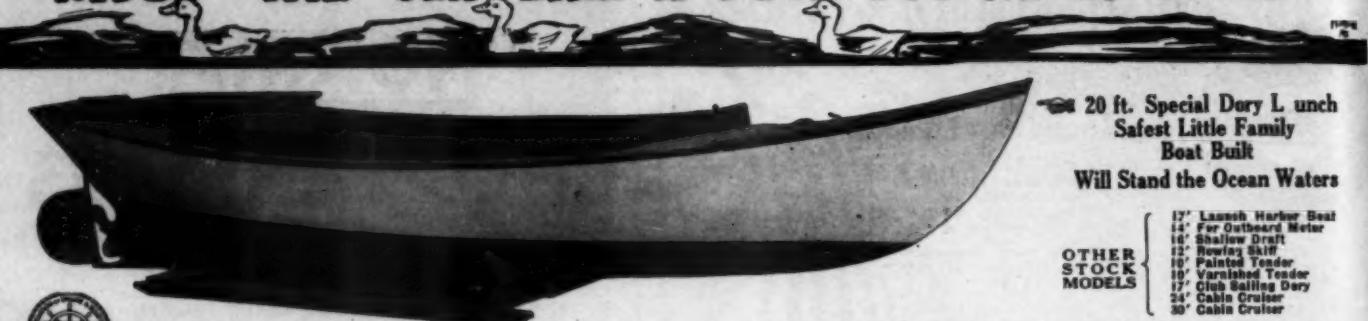
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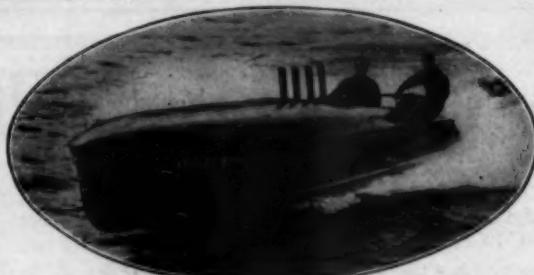
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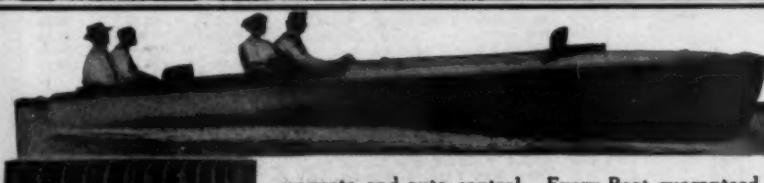
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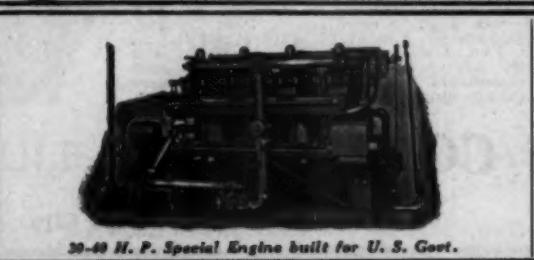
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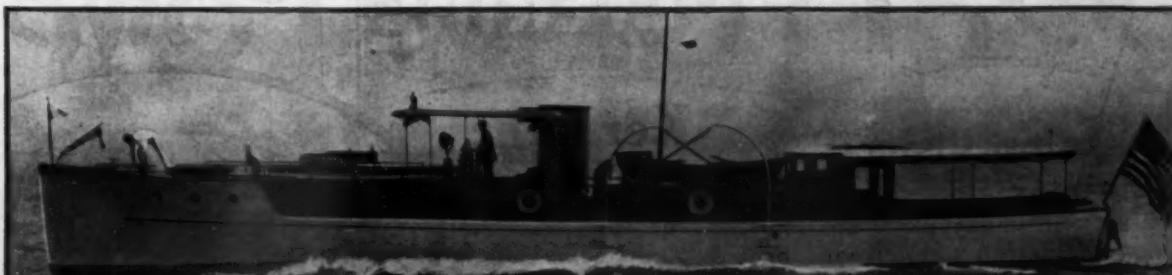
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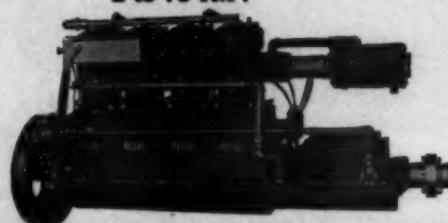
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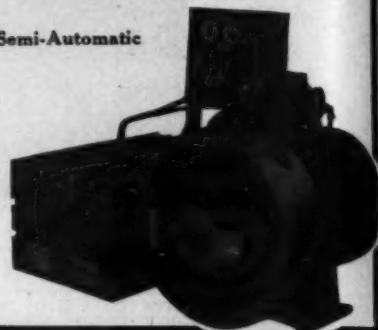
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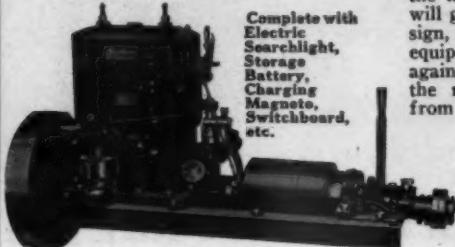


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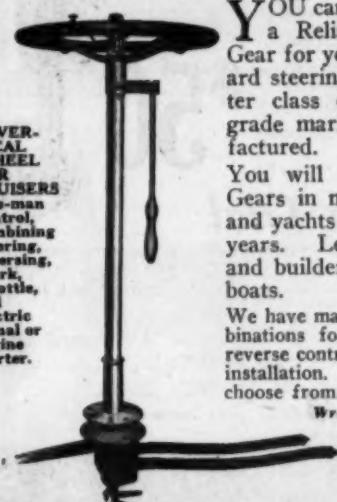
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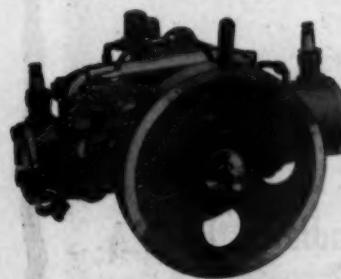
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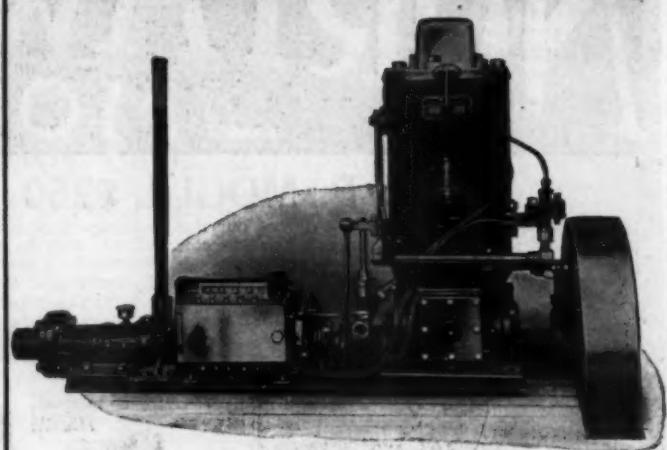
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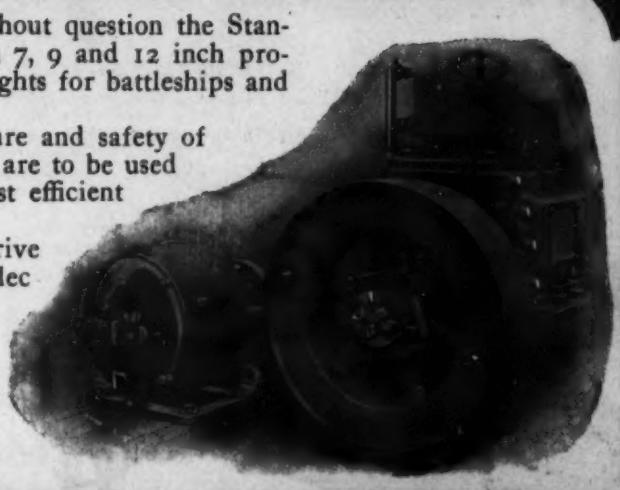
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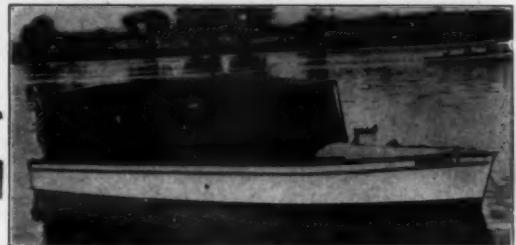
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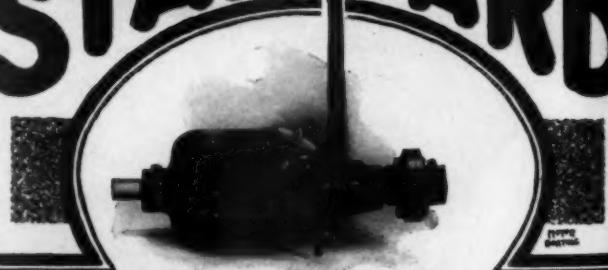
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Strength is gained by using the best possible materials and making important parts amply large to withstand any strain. Lightness is secured by cutting out every ounce of unnecessary weight. Quietness is insured by the accuracy of machine work. Durability is guaranteed by the all around excellence of design and construction.

Thousands of gears we have built during the past ten years are quietly advertising the quality of Standard Gears.

Built in four sizes, for transmitting from 1 H.P. per 100 R.P.M. to 225 H.P. for 1500 R.P.M. Iron or aluminum case.

*Write today for our latest catalog
which gives full information and prices.*

Michigan Standard Gear Co.
Detroit, Mich., U. S. A.

CURTISS YACHT CAPSTAN



Fig. 2008

This Capstan is intended for Boats between 50 and 85 feet, as it is made for $\frac{3}{8}$ inch B. B. B. Chain only.

Has handles on each side and is very powerful. Friction brake in head controlled by wheel at after end.

Capstan runs either right or left, controlled by ring on forward part of head.

The essential feature of this Capstan is: may be used for either rope or chain, or both at same time; the wildcat may be used independently of rope drum and vice-versa, the drum may be worked with wildcat fixed, by simply removing the pin which binds the drum and wildcat together; the only small Yacht Capstan possessing this feature.

Weight, 105 pounds.

Dimensions: Height, 15 inches; Diameter of Head, $10\frac{1}{2}$ inches; Diameter of Base, $12\frac{1}{4}$ inches.

Price, all Bronze, Polished.....\$125.00

Price, Galvanized.....70.00



FIG. 2003

A compact Galley Pump that may be set at any angle required.

1 $\frac{1}{2}$ -inch Bore 2 $\frac{3}{4}$ -inch Stroke

Polished Brass Each, \$8.50

Nickel-Plated " 10.00



Fig. 1404

With Pump

Lining and Fixtures Nickel-plated. Porcelain Bowl. Mahogany or Quartered Oak Case.

Cock on pump swings upward, thus preventing breaking of bowl. Soap-dish is porcelain and removable.

No. 5

Height, 19 inches Width, 19 inches

Depth Closed, 6 inches

Quartered Oak Case..... Each, \$42.50

Mahogany Case " 44.00



Fig. 1392

J. H. CURTISS CO.

2 South Street

: : :

New York City

Wright Heavy Duty Marine Engines

For a big cruiser or a heavy commercial boat there is only one kind of an engine to buy. That is a reliable engine,—one that will endure the hardships of continuous severe service without delays for repairs and replacements.

Reliability and durability is built into the Wright Engine by the quality of material and strength of construction we use. Crankshaft and connecting rods are hand-forged from solid billets of 25 to 40 point Carbon Steel.

Economy of fuel is secured by our overhead valve construction,

which gives 20 to 25% more power per unit of fuel than any other type of engine. We also equip these engines to burn kerosene, using one carburetor for the gasoline when starting and a separate carburetor for kerosene, also a special generator for GASIFYING the kerosene thoroughly.

Kerosene GASIFIED—not merely vaporised.

The kerosene is converted into a perfect gas—not merely a wet vapor—by supplying the kerosene carburetor with hot air and then passing the vapor through a heated generator which gasifies it. This prevents all carbon trouble in the cylinders and on the valves, and gives an exhaust as clear as on gasoline.

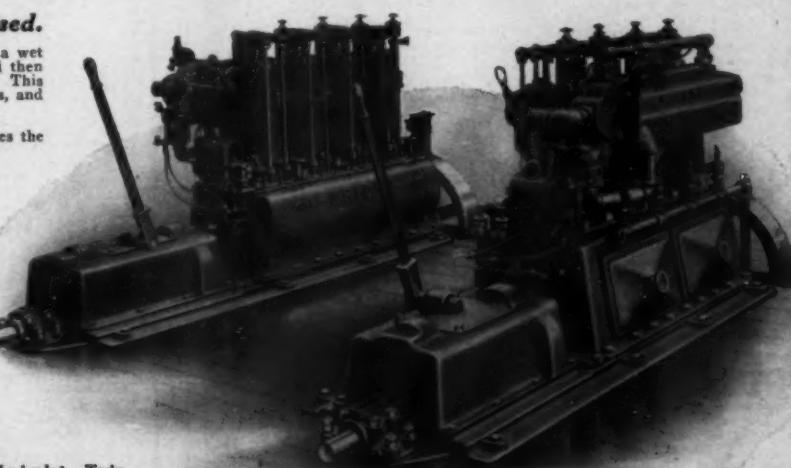
A piston type throttle valve, controlled by one lever, enables the operator to change instantly from gasoline to kerosene.

Economy of maintenance is secured by the infrequency of repairs and the wonderful accessibility for quick adjusting. For instance, the entire valve mechanism and camshaft can be removed without taking off any other parts.

Wright Engines are equipped with mechanical make and break ignition, using a Bosch Low Tension Magneto. The spark is advanced or retarded through the magneto, the same as a jump spark system.

Reverse gear with large spurs is built on same base casting with engine and entirely enclosed. No gears are in use on forward drive and the thrust is taken up by large adjustable Ring Type Thrust Bearings. Reverse gears can be removed without disturbing engine crank shaft.

3-Cyl. 6 x $7\frac{1}{2}$ ", 22-30 H. P.
 3-Cyl. 7 $\frac{1}{2}$ x 9", 38-45 H. P.
 4-Cyl. 6 x $7\frac{1}{2}$ ", 30-40 H. P.
 4-Cyl. 7 $\frac{1}{2}$ x 9", 45-60 H. P. Wright Twin
 6-Cyl. 6 x $7\frac{1}{2}$ ", 45-65 H. P. Screw Outfit
 6-Cyl. 7 $\frac{1}{2}$ x 9", 70-90 H. P. (right and left
 6 x $7\frac{1}{2}$ " runs from 400 to 550 R. P. M. engines) equipped
 7 $\frac{1}{2}$ x 9" runs from 350 to 475 R. P. M. for using
 Kerosene fuel



WRITE TODAY FOR FULL DETAILS OF THIS ENGINE. RELIABLE AGENTS WANTED

WRIGHT MACHINE COMPANY Owensboro, Ky.



One Coat This Fall

will preserve the wood—keep the under body in fine condition through the winter and give you a hard, smooth surface for a spring coat.

It is now all put up Double Strength for Topside

Semi-Enamel Yacht White and Gloss Black.

— Stearns-McKay —

Marblehead Anti-Fouling Green or White Bottom Paint

STEARNS-MCKAY MFG. CO.
MARBLEHEAD, MASS., U. S. A.

**FERTILE SOIL, MILD CLIMATE
DOWN SOUTH**

Valuable Information FREE!

There are wonderful opportunities in the South for energetic farmers. Thousands of acres of farm land at cheap prices and on reasonable terms are waiting for development. No long and cold winters. Excellent climate, markets, transportation, water and health. Great cotton, corn, oats, hay, cattle, dairy, orange, grapefruit and market gardening country. Splendid fishing and hunting.

Two and Three Crops a Year

Farmers are getting rich in the South by intelligent application of modern methods. There is room for thousands more. The South is favored by nature and wants more settlers.

Secretary of Agriculture Houston declared in a recent address that in point of climate and in length of grazing season the South has a material advantage over the rest of the nation.

FREE INFORMATION cheerfully furnished regarding Southern Farm Lands. You Are Invited to Write Today to the

Southern Land Bureau
THE GEORGIAN-AMERICAN
"The South's Greatest Newspapers"
Atlanta, Georgia

When The Cold North Winds Blow Set Your Sail
And Away You Go

ICE YACHTING

But On The Nicest Winter Day When There's No Wind, You Can Speed Away

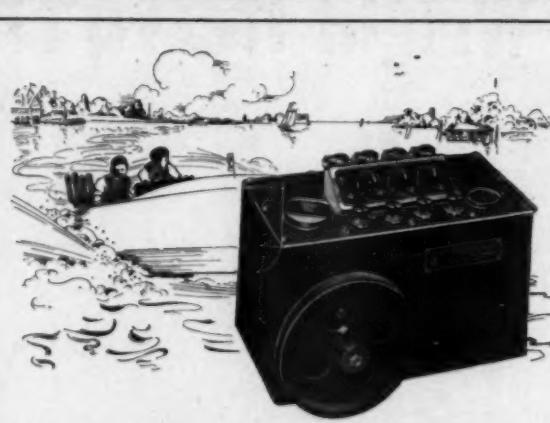
AERO-SLEDDING



Ask your sporting goods dealer, or write us for catalogue giving full details of this

PEERLESS WINTER SPORT

AEROTHROST ENGINE CO.
505 Madison St., LA PORTE, INDIANA



Too much oil is wasteful; too little is dangerous.

Detroit Force Feed Oilers

drive oil to the points to be lubricated in accurately measured, unvarying quantities.

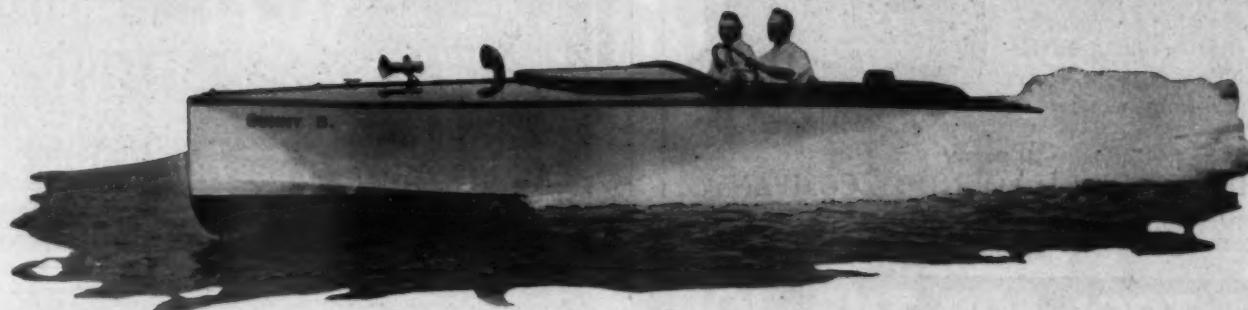
Manufactured by the Detroit Lubricator Company, known for forty years as the world's largest manufacturer of lubricating devices.

Our booklet P64 sent on request.

DETROIT LUBRICATOR COMPANY
DETROIT, U. S. A.

Makers of Stewart Carburetors

VALLEY BOATS.



From STOCK or BUILT to YOUR ORDER

You can have a real Quality boat and still save from 10% to 40% if you buy your boat from us. Valley boats are Quality boats—up to the minute in design and having the finest of materials and workmanship.

We will sell you the complete finished boat, with or without power, or merely the frame, planking, planked hull, decking or whichever parts you want. Our stock designs are from some of the most prominent naval architects in the country.

We have specialized in V-bottom boats, from the 16-ft. hydroplane to a 40-ft. cruiser. If you don't find the boat you want in our stock, we are competent to prepare a special design to suit your ideas.

Write today for catalog.

VALLEY BOAT CO., River Street, Saginaw Mich., U. S. A.

A Few Bargains

18-FT. FAMILY BOAT	
Ready for motor.....	\$109.00
Plank Hull.....	49.00
Erected frame.....	28.00
21-FT. SPEED RUNABOUT	
Erected frame.....	\$25.00
16-FT. V-BOTTOM HYDROPLANE	
With motor.....	\$495.00
Speed, 30 Miles per hour.	
17-FT. V-BOTTOM HYDROPLANE	
Planked Hull.....	\$58.00
Also 19, 21, 22 and 24-ft. boats and hulls.	
Write for bargain sheet.	

EVINRUDE

DETACHABLE ROWBOAT & CANOE MOTOR

for 1917 has more speed, more power. The famous Evinrude Magneto—Built-In Fly Wheel Type—and the Automatic Reverse, with improvements—will be continued as standard equipment.

The ninth year of the Evinrude starts off with 70,000 satisfied users. Twenty-two different governments, including the United States, have adopted the Evinrude. Originally designed for rowboat use, its scope has been so broadened that today you will find the Evinrude used on canoes, sharp pointed skiffs, duck boats, house boats, sail boats, yachts, tenders, dinghies, work boats, rafts, etc. So varied are the uses that the Evinrude has become known as "the universal motor."

You'll be interested in the new 1917 catalog. A postal will bring it.

OVER 70,000 SOLD

EVINRUDE MOTOR CO.
541 EVINRUDE BLOCK, MILWAUKEE, WIS., U. S. A.

DISTRIBUTING BRANCHES:

69 Courtlandt St., New York.
214 State St., Boston.

211 Morrison St., Portland.
436 Market St., San Francisco.



SHIPMATE RANGES

10 SIZES
14 NUMBERS

When your oil stove is out of gear and hunger has you jammed down on a lee shore and your stomach thinks your throat's cut, just say to yourself, "It wouldn't have happened if we had a little SHIP-MATE aboard." Always reliable—fair weather or foul.



MADE BY

THE STAMFORD FOUNDRY COMPANY

Established 1830

STAMFORD, CONN.

THE TOOL FOR THE JOB

No matter what engine adjustment you tackle, you will find you have the right tool for the job if you have the Champion Ratchet Wrench Set No. 77 aboard. Contains ten hardened pressed steel hexagon sockets—17/32, 19/32, 3/4, 11/16, 23/32, 25/32, 13/16, 29/32, 1, 1 1/32. One spark plug socket 29/32 fitting standard plugs, all steel ratchet wrench, steel extension bar, and drop forged steel universal joint. In finely finished box, \$4.00.

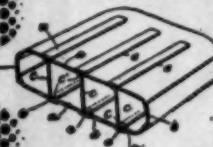
There's real satisfaction in working with such tools. Save their cost in time and labor on the first job.

Other sets, \$1.50 to \$18.00
Write today for complete catalog

Syracuse Wrench Company
SYRACUSE, N. Y.
U. S. A.

METROPOLITAN
AIR GOODSLIFE PRESERVER AIR, AND KAPOC FLOSS
CUSHIONS AND MATTRESSES

Metropolitan Air Goods are made for the better class of motor boats and yachts—for those on which the quality, durability and safety of the equipment is the first thought. They cost a little more than ordinary cushions and mattresses but they are the cheapest in the end and most satisfactory by far.



Our exclusive patented construction, illustrated by this sectional drawing, is an important feature of Metropolitan Air Goods. It adds durability by helping them to keep their shape and eliminates the "rolling" motion noticeable in other mattresses.

Light
Comfortable

Cleanly
Safe

Sanitary
Durable

Write today for complete illustrated catalog and prices. All sizes and styles in stock patterns, also made to order from your own patterns to fit your boat.

We also carry a complete line of leather-covered, "No Sink" KAPOC FLOSS CUSHIONS, CORK and PNEUMATIC GOODS for every purpose.

ATHOL MFG. CO.

71 Chestnut Hill Ave.,
Athol, Mass.



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Advertising Index will be found on page 60.

COMPLETE ELECTRICAL EQUIPMENTS

FOR MARINE PURPOSES

STARTING
AND
LIGHTING
WARD LEONARD
SYSTEM



IGNITION
AND
BATTERIES
LAMPS, METERS
SWITCHES
CABLES, ETC.

WAGNER-HOYT ELECTRIC COMPANY
1902 BROADWAY
NEW YORK

LOBEE CIRCULATING
& BILGE PUMP

You can't get a better or more reliable pump than the Lobee because there isn't a better one made. It has been the World's Standard of Pump Quality for 16 years. No other pump has proven so popular in the marine trade. Simple, compact, noiseless and positive. These pumps will outwear the engines to which they are attached.

Gear and Rotary Pumps from $\frac{3}{8}$ " to $1\frac{1}{2}$ " suction and discharge. Different designs for various types of drive and mounting made to order.

Write today for catalog and prices
Sold by Leading Dealers Everywhere

Lobee Pump & Machinery Co., 57 West Bridge Street
Buffalo, N. Y., U. S. A.

UNIVERSAL
High Grade Accessories

12" galv. Steering Wheels	\$1.00
Brass Stuffing Box, 1" size	.90
6" Fog Bells	1.00
Fire Extinguisher	.35
Schebler Carburetor, 1 1/4"	7.55
Class 1 Equipment, consisting of Lamps, Fire Extinguisher, Whistle and Life Preserver	5.85
Class 2 Equipment, consisting of 4 Lamps, Horn, Fire Extinguisher, Bell and Life Preserver	11.50
Class 3 Equipment, consisting of 4 Lamps, Horn, Fire Extinguisher, Bell and Life Preserver	13.50
1" Pol. Brass Flush Flag Pole Sockets, Bow and Stern, per pair	.45

Universal Motor Boat Supply Co.

Office
287 Broadway, NEW YORK

Warehouses
Atlantic Highlands, N. J.

W. & J. Tiebout
Established 1853

MARINE HARDWARE

Ship Locks & Joiner Hardware

118 Chambers St., New York City.

MOTOR BOATING

DYSON STANDARD SCREW PROPELLERS

For Motor Boats
and Small Vessels

We also manufacture bronze propellers of all sizes from 10 inches to 20 feet in diameter



10 to 48 inches in Diameter

THREE MODELS

MADE OF

**SPARE'S
MANGANESE BRONZE**



Scientifically Designed by

CAPTAIN CHARLES W. DYSON, U. S. N.
International Authority on Propellers



Sole Manufacturers

AMERICAN MANGANESE BRONZE COMPANY
3431-3521 Rhwan Street HOLMESBURG, PHILADELPHIA, PA.

Write for New Catalog

ELECTRIC LIGHTS

THERE is only one safe and practical light for motor boats, and that is electric light. Its cleanliness, convenience, and economy are invaluable, no matter how large or small your boat may be.

You can equip your boat with a complete electric lighting system at small cost if you install a

Henricks Eureka Motor Boat Lighting Outfit

Our Eureka Lighting Outfits combine the electric lights and motor ignition into one simple troubleproof system. You can use a magneto alone, or generator and storage battery, with or without switchboard. We can furnish an outfit to operate as many lights as you want, up to an equipment adequate for a 60-foot cruiser.

The first cost of Eureka is the only cost. It is automatic and self contained. Requires very little attention.

We have been building magnetos for seventeen years. Our famous Comet Magneto is used for ignition or lights on thousands of power boats.

Magnatos for Ignition and Lights Direct from \$10.00 Up.
Lighting Outfits, consisting of Generator and Storage Battery, \$30.00 and Up.
Switchboards, \$12.00 and Up.

Write us today for catalog which gives details of lighting outfits for all sizes of boats up to 60 ft.

HENRICKS MAGNETO & ELECTRIC CO.

Formerly Henricks Novelty Co.

HOME OFFICE:

1355 St. Paul Street, Indianapolis, Ind.

120 Liberty Street, New York City

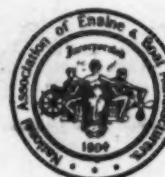
24 California Street, San Francisco, Cal.

1917 THIRTEENTH ANNUAL

Grand Central Palace, New York

Opens Saturday, January 27th
 Closes Saturday, February 3rd

FOR SPACE, INFORMATION, ETC., ADDRESS



NATIONAL MOTOR BOAT SHOW

50,000 Square Feet of Exhibition Space

The World's Greatest Display of
 BOATS, ENGINES and ACCESSORIES

IRA HAND, SECRETARY, 29 WEST 39th ST., N. Y. C.

If You Want a Friend That Will Stick Forever, Try

JEFFERY'S MARINE GLUE

In some places economy is all right, but when you come to Marine Glue the difference in cost between the ordinary and the best is so little that you can't afford to take the risk of having to do the job over again for the sake of saving a little on the material.

It pays to use Jeffery's in the first place, every time. Jeffery's is universally conceded to be the best and most reliable marine glue. Jeffery's Glues are specified by the best designers and used by the best builders. A little investigation will show you why.

No. 1—Extra Quality for Deck and Hull Seams of Yachts and Motor Boats. Black, white, yellow or mahogany color. Give black the preference; it is more elastic and satisfactory in every way.

No. 7—Soft Quality for Waterproofing Canvas, for Covering Decks, Tops of Cabins, Canvas Boats, Canoes and Flying Boats. Black, white or yellow. With a coat of paint once a year it will last as long as the boat.

Waterproof Liquid Glue is used for the same purposes as No. 7, Soft Quality. Ready for use and requires no heating; simply open the can and paint it on. Especially recommended in combination with linen between the diagonal of flying boats. Will also attach canvas, cork, felt, rubber, leather, and linoleum to iron, steel, or wood.

Special Marine Canoe Glue. Best Filler for Canvas. Black, White and Yellow. Every canoeist should carry one of our 25c emergency cans. Sent by mail on receipt of 30 cents in stamps.

FOR SHIP'S DECK USE No. 2 First Quality Ship Glue, No. 3 Special Navy Glue.
 Put up in 1, 2, 3 and 5 lb. cans; also 14, 28, 56, 112 lb. boxes.

Sold by all Boat and Canoe Supply Houses, Hardware and Sporting Goods Dealers.
Write to-day for booklet "What to Use and How to Use It." It contains a fund of valuable information that every practical boat owner and builder should know.

L. W. FERDINAND & COMPANY, 152 Kneeland Street, Boston, Mass., U.S.A.



Luders

A Few Late Luders Productions

KEMAH—146-ft. Steel Motor Yacht. Now building for Mr. F. E. Lewis, Saugatuck, Conn.

AURORE—96-ft. Motor Yacht Built for Mr. Stewart Wyeth, Philadelphia.

PATROL BOAT—U. S. Navy. 66-ft. 30 miles per hour.

PATTINA—60-ft. Express Cruiser. Built for Sir Chas. Ross, Quebec. Speed, 28 miles.

HELEN—60-ft. Express Cruiser. Built for Mr. A. J. Moxham, New York.

ELITHRO—55-ft. Express Cruiser. Built for Mr. J. Kelly Robinson, Jr., New York.

ZIG-ZAG—44-ft. Day Cruiser. Built for Mr. Conrad Stern, New York.

C-6—36-ft. Day Cruiser. Built for Mr. W. B. Frost (former owner of Cero), Stamford.

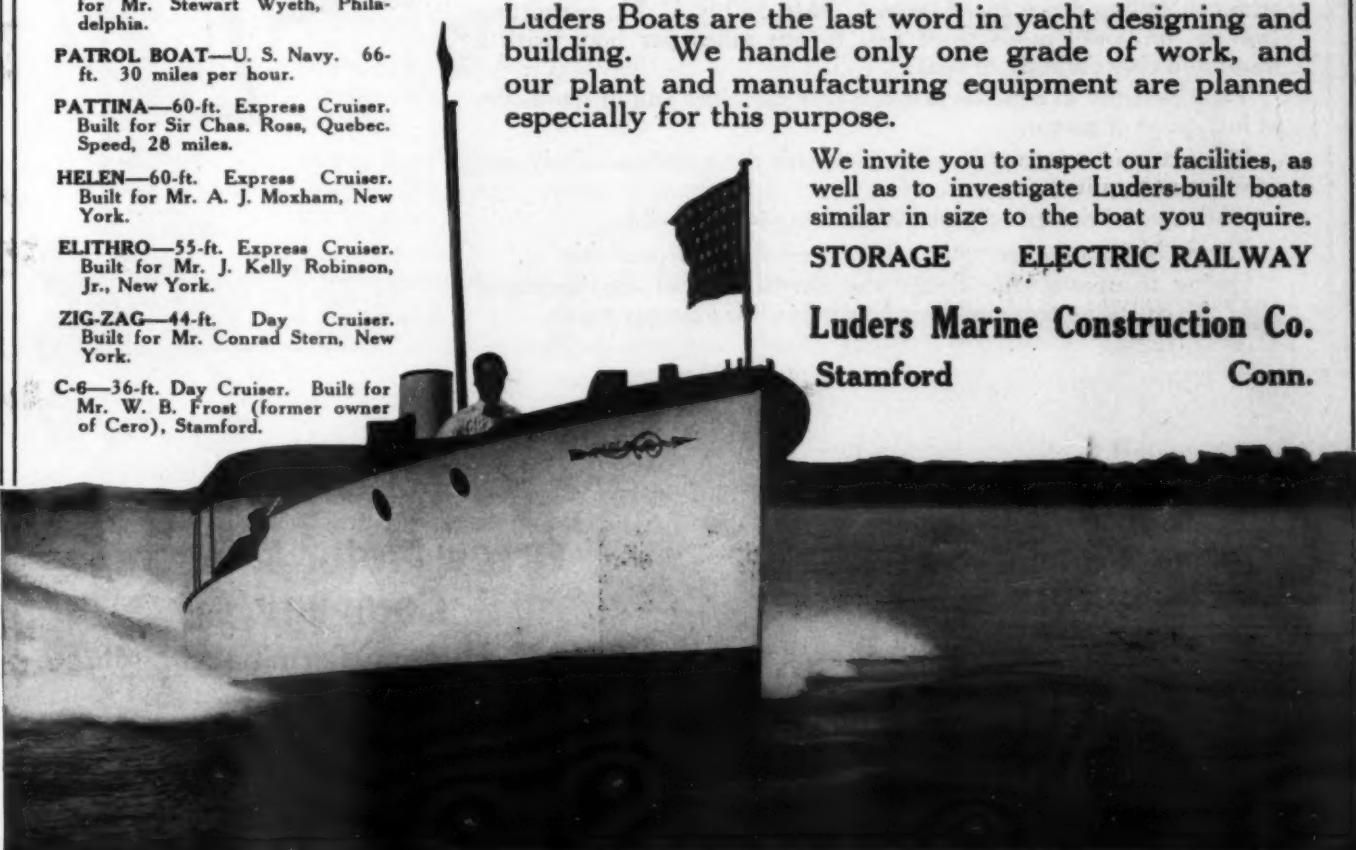
WE are now specializing in the construction of the larger motor yachts and cruisers. The average size of the boats we have built this year is considerably in excess of the average for past seasons.

Luders Boats are the last word in yacht designing and building. We handle only one grade of work, and our plant and manufacturing equipment are planned especially for this purpose.

We invite you to inspect our facilities, as well as to investigate Luders-built boats similar in size to the boat you require.

STORAGE ELECTRIC RAILWAY

**Luders Marine Construction Co.
Stamford Conn.**



The ARROW Detachable Out-board Motor Line for 1917

Will include 4 H.P. and 3 H.P. Double and 2½ H.P. Single Cylinder Motors



We have, as a result of past years' experimenting and experience, a smooth and even running double cylinder motor that does not shake the boat.

A motor practically without noise or vibration, and one that will start quickly and easily under all conditions.

Fitted with priming cups and a simplified carburetor that will admit throttling down speed from 1200 to 300 R. P. M., permitting trolling, or boat speeds from two to ten miles per hour with a minimum consumption of fuel.

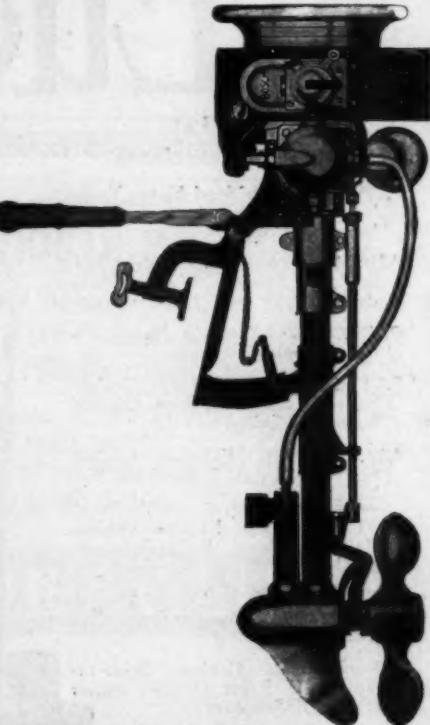
Tank capacity of a gallon and one pint permits a run of five hours at full speed of motor.

Lubrication by means of oil mixed with the gasoline. Only one grease cup required.

With special design of parts, back firing is impossible.

Arrow Motors are exceptionally powerful and dependable.

Owing to unavoidable delay, the illustrations of the improved 1917 ARROW motors could not be used in this advertisement.



Write today for "Arrow" booklet.
Dealers Wanted.

**Arrow Motor & Machine
Company, Inc.**

422 Hudson Terminal Building
New York

PACIFIC COAST DISTRIBUTING AGENTS:
San Francisco, Calif., Weeks-Howe-Emerson Co.
Seattle, Wash., Woodhouse Gasoline Engine Co.
Los Angeles, Calif., Marine Engine & Supply Co.



THROUGH FIRE and WATER

MASTER

CALORITE SPARK PLUGS



Read how we tested Master Calorite Spark Plugs before placing them on the market—

Heated them *Red Hot* and plunged them into cold water 26 times.

Then heated them *White Hot* and plunged them into cold water 10 times. They stood up under these radical tests—showed no ill effects whatsoever. They proved themselves worthy the name Master.

No Spark Plug is ever subjected to such violent temperature changes in service—

Master Calorite Spark Plugs are built throughout to withstand not only great extremes of Heat and Cold. But—

All of the abusive trip hammer blows inflicted by the thousands upon thousands of cylinder explosions—Furthermore

They will withstand a higher electrical voltage than porcelain, insuring positive insulation. Constructed of the finest material obtainable—these Quality Spark Plugs should immediately recommend themselves to discriminating buyers.

Engines equipped with Master Calorite Spark Plugs will have no ignition troubles.

Dealers replacing plugs—will do well to install Master Plugs—thus giving real service and gaining a loyal and satisfied customer.

Motor Boat Owners—Should demand Master Calorite Spark Plugs—They put a genuine spark of Life into the Heart of the engine—

Once installed—Ignition troubles are forgotten. "You pay a little more, but you get the worth of your money"—

Our guarantee shows our confidence in the ability of Master Calorite Plugs to make good under all conditions.

"We guarantee MASTER CALORITE SPARK PLUGS against defects of material or workmanship, and will replace free of charge, any CALORITE insulators broken by heat, which are returned to us transportation prepaid."

Send for Descriptive Literature and Our Proposition to the Trade
Five Styles—Half Inch Regular— $\frac{1}{8}$ in. Regular—Metric— $\frac{1}{8}$ in. Long—
Half Inch Long.

RETAIL PRICES: \$1.00^v and \$1.25 net each DEPENDING UPON THE TYPE

Attractive Display Stand in four colors 14 x 20" is now ready for aggressive dealers stocking Master Calorite Spark Plugs. If you have Master Spark Plugs in stock and have not received your Display Stand, write for it at once.

MASTER CALORITE SPARK PLUGS

Made in the U. S. A.

Manufactured and Guaranteed by

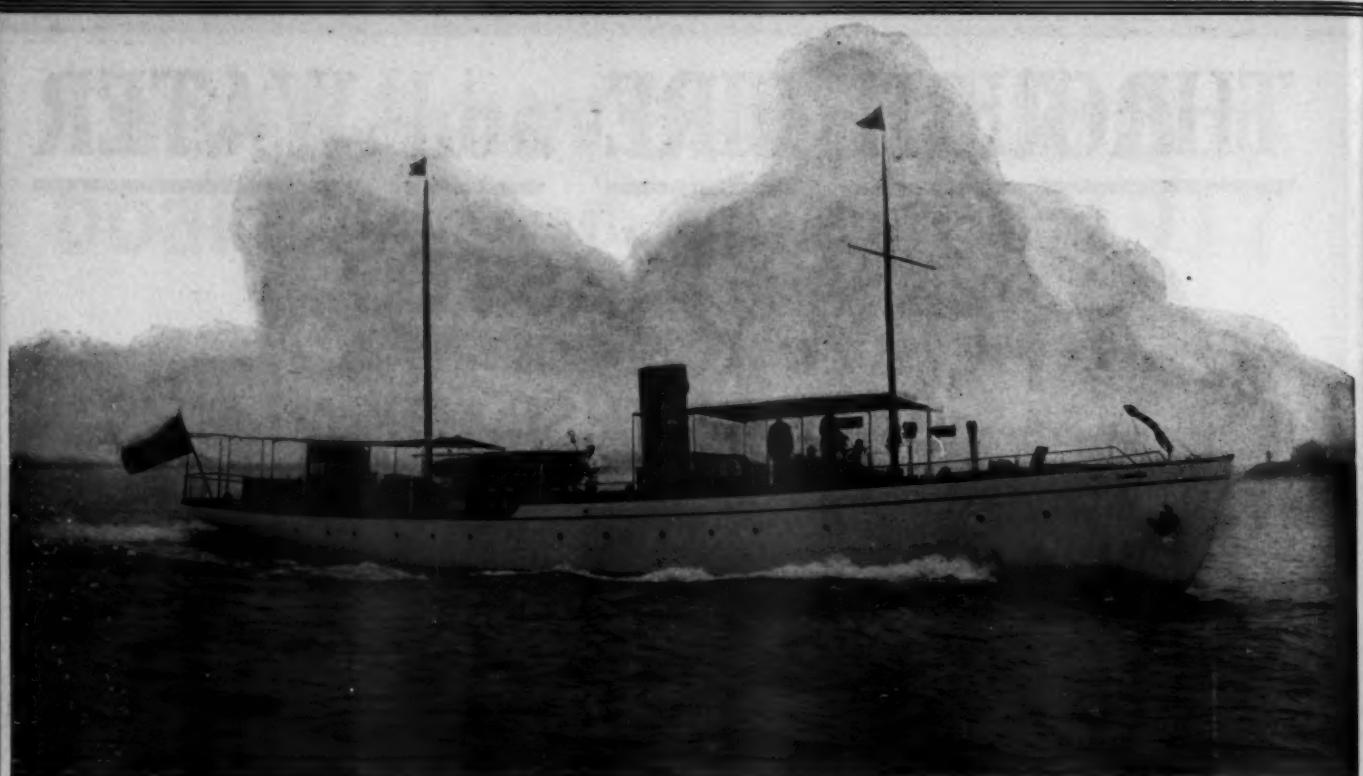
The Hartford Machine Screw Company 534 Capitol Avenue
HARTFORD, CONN.



MASTER
Calorite Spark Plug
Extra Long, \$1.25 Each
Especially adapted
to Marine Engines



MASTER
Calorite Spark Plug
Regular Length
\$1 Each



Yacht "Albacore," Lieut. Comm. J. K. L. Ross, Montreal, owner. 106 x 16 x 5. Equipt with two 6-cylinder, 9½ x 14, 200-H.P. Wintons; designed by Tams, Lemoine & Crane, and built by Lawley.

S E R V I C E

Launched in June, 1914, for the personal use of her owner. The "Albacore" at the outbreak of war found her way into the service of the Canadian Government for Patrol service in the St. Lawrence and Gaspe Bay Districts.

To date "Albacore" has "logged" 25,000 knots. She has been out of service for but 18 hours since launching and never because of engine trouble. A record we believed to be without parallel.

The "Albacore" is a modern yacht, built and equipped with the best. That Winton Engines were chosen to power her is logical. That this confidence has not been misplaced is indicated by the fact that the "Albacore" has always been ready, there have been no delays because of the engine and what is of infinitely greater interest there has been to date "No Repair Expense."

Gasoline Engines

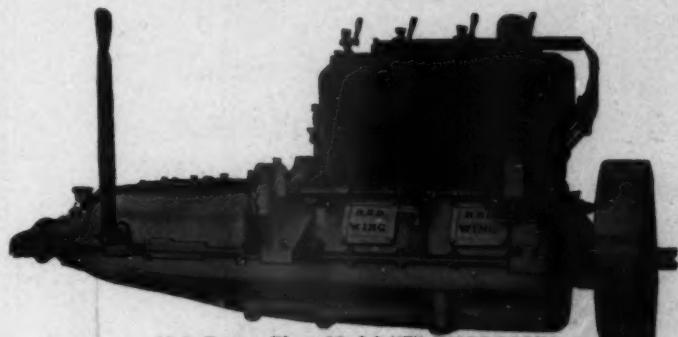
Oil Engines

WINTON ENGINE WORKS
CLEVELAND, OHIO

Red Wing Thorobred

THE MOTOR WITH POWER TO SPARE

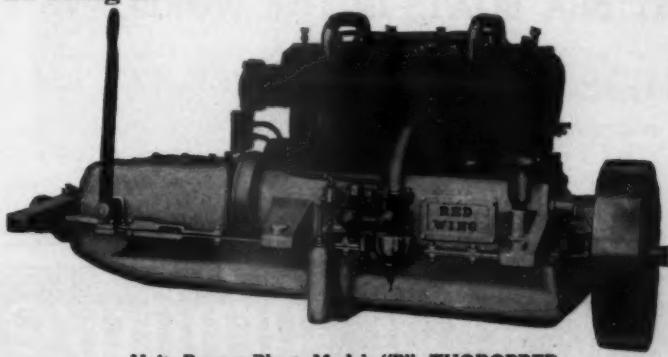
"Thorobred's" Majority is Safe



Unit Power Plant Model "F" THOROBRED
28-36 H. P., 4 1/16 x 5"
Furnished with or without Unit Power Plant

will cost. These are strong statements, but we have the proof and welcome an investigation of our claims.

The 1917 line of Red Wing Thorobreds includes models from 14 to 40 H. P., ranging in price from \$225.00 up. These models embody every refinement known to the modern motor industry, and are supplied with every modern equipment desired, such as unit power plant, electric starter, etc., when desired. They are as near "perpetual motion" as an engine can be and if there was any method of bettering the Thorobred we certainly would be using it.



Unit Power Plant Model "B" THOROBRED
32-40 H. P., 4 1/2 x 5"
Furnished with or without Unit Power Plant

The Thorobred has actually become the Standard of American marine motors and it is backed and guaranteed by one of the largest manufacturers in America. Among its many features is that it also burns kerosene for fuel, therefore a money-saver in work boats.

We also manufacture 2 cycle engines from 3 H. P. up.

Write for Complete Information Now.

RED WING MOTOR COMPANY, DEPT. B.
Red Wing, Minn., U. S. A.

When writing to advertisers please mention MOTOR BOATING, the National Magazine of Motor Boating.
Advertising Index will be found on page 60.

VIPER

Reg. U. S. Pat. Off.

VIPER SEA SLED

HICKMAN PATENTS

SEA SLED

Reg. U. S. Pat. Off.

**Latest Type Sea Sleds for Aviation Division, United States Army**

Able, seaworthy boats, designed for rescue work in open water.

Length, 28 feet. Weight on trials, 7800 pounds.

Two six-cylinder 6" x 6" engines

GUARANTEED SPEED, 35 STATUTE MILES PER HOUR**Speed Shown on Official Trials, 43.54 Statute Miles Per Hour**

Run from Gloucester to Boston, 28 miles, 18 miles of which is open water, in a stiff chop. Army officials aboard. Revolutions, 1200. Time, 48 minutes.

INCOMPARABLY THE FINEST SEA BOATS IN THE WORLD**MURRAY & TREGURTHA CO.**340 West First Street
South Boston, Mass.**THE VIPER CO., Ltd.**Pictou, Nova Scotia
Canada**WICKER-KRAFT Yacht Furniture**

The genuine Wicker-Kraft, identified by this trade name, is the original yacht furniture of this popular type. Wicker-Kraft ideas and Wicker-Kraft designs are widely imitated, but the uniformity of Wicker-Kraft quality has never been equalled.

The genuine Wicker-Kraft Furniture is regularly used by such well-known builders as Lawley, Seabury, Luders, Elco, Great Lakes, Albany, Fay & Bowen, Niagara, Matthews and others of the same class. Superb in design and built with materials and finish which withstand the severe exposure of marine service.

Special designs for canoes, rowboats, launches, express runabouts, day cruisers and cabin cruisers. The popular idea of enclosing a life preserver under the seat of the chair is an original Wicker-Kraft feature. Write for illustrated catalog and prices.

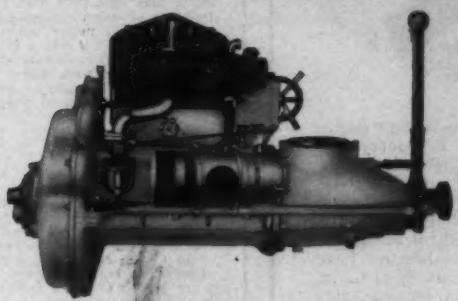
WICKER-KRAFT CO.

H. G. Pratt, Proprietor, Newburgh, N. Y., U. S. A.





Gasoline
Kerosene
Distillate



"MB" 13-15 HP
Other Sizes
10 to 125 HP

The Emergency Engine



"Great Bear" on Pinnacle Rock

Unfaltering dependability in the moment of supreme test has always been a strong SCRIPPS characteristic.

Larsen found it in the Whirlpool Rapids—Day, on the long grind across the Atlantic—Bonnell and Nutting, in the 1,000 mile Ocean dash through the fogs of Fundy.

Again, when the Arctic Explorer, "GREAT BEAR" foundered on Pinnacle Rock, the SCRIPPS equipped life boat lived up to SCRIPPS performance and saved twenty-one lives.

For certainty of service and motor comfort the SCRIPPS is your safest selection. The price is reasonable—in fact, no more than ordinary engines if actual power and equipment are considered.

Above is shown the "MB" 13-15 H.P., a great engine for life-boat, auxiliary, small cruiser, or work boat. Other sizes, 10 to 125-H.P.

Dealers in all principal cities. Consult your Telephone Directory under "Scripps" for local address, or send for new catalog now ready.

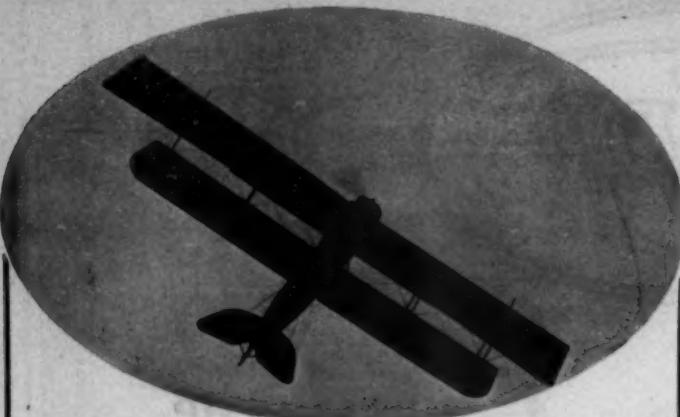
SCRIPPS MOTOR CO.

631 Lincoln Avenue

Detroit, Mich.



SCRIPPS MOTOR CO., 631 Lincoln Ave., Detroit, Mich.



JUST how Ruth Law and Victor Carlstrom made their flights from Chicago to New York, and Lawrence B. Sperry flew from New York to Boston and from Marblehead to New York, is told in *FLYING* for December.

In a series of articles on Night Flying Mr. Henry Woodhouse gives the first authoritative presentation ever made of the different aspects of this youngest branch of the youthful science of aerial navigation. As leading foreign military authorities have stated, while the exigencies of war require that pilots fly at night, and they are trying different methods as fast as possible, this branch of the service is still undeveloped.

Water Flying—Soaring over water and land at a speed of between 60 and 100 miles per hour, cutting across promontories, as nothing else excepting the sea-gull can do—is the new thrilling and exhilarating sport which *FLYING* has fathered ever since the early days when there were not yet any flying boats, and the hydro-aeroplane was considered a freak.

The necessity of providing **OUR AERIAL DEFENSES** with 17 aero squadrons, 127 kite balloons and 6 dirigibles is discussed in December *FLYING*. These aircraft are needed to supply the aeronautic auxiliaries' need for the 45 batteries of field artillery and the 73 forts in the 6 coast artillery districts which are now blind, as it were, so that the territory which they should protect would be at the mercy of the long-range guns of vessels lying beyond the point of vision of the artillery observers stationed in the forts. Hundreds of millions of dollars are invested in the coast defenses and field artillery which would be ineffective without the aerial auxiliary.

2,000 Aviators Wanted for National Defense

In view of the fact that the shortage of officers in the Army and Navy is such that there are not sufficient officers in the Army to officer the coast defenses and mobile Army, and in the Navy to officer more than part of the fleet in commission, and therefore officers cannot be obtained for the air service without starving the other branches of the service, *FLYING* as the official publication of the Aero Club of America and its thirty constituent Clubs urge the Army and Navy Departments to fill the ranks of their aerial reserves without delay, and foster the development of aeronautics in the Militia, so that there shall be made available as soon as possible at least 2,000 pilots for national defense.

Six other nations have each between 2,000 and 9,000 aviators and are increasing their aerial forces daily. The U. S. Army and Navy have only about 100 aviators between them, and, under the present National Defense Act, could not increase the number of aviators in the regular services to even the small total of 400 within five years.

Aeroplanes for Coast Guard Service

The last Congress authorized the employment of aeroplanes in the Coast Guard, for the purpose of saving life and property along the coasts of the United States and at sea contiguous thereto and to assist in the national defense. December *FLYING* urges that the appropriations be allowed as soon as Congress meets, so that this good work may proceed without delay.

The Aerial Coast Patrol

Also the value of the Aerial Coast Patrol as a means of training civilians in the use of aeroplanes for national defense, thereby creating a reserve of civilian aviators, trained in naval aeronautics operating under the direction of the Navy Department, and establishing a chain of aeronautic stations along our coasts, under control of the Navy, to which civilians who wish to contribute their efforts to the upbuilding of the naval Air Service can become connected, has been emphasized by the advent of the trans-Atlantic submarine.

A Call to Patriotism

The aeronautic movement is supported by red-blooded people who believe that the country of Langley, the Wrights and Curtiss and other pioneers should be foremost in aeronautics.

To be progressive you must join the aeronautic movement. Send **TWO DOLLARS** and be fully informed concerning this most wonderful movement for the next year.

Flying

280 Madison Avenue, New York City

Prompt Deliveries Certain for 1917

(Continued from page 92)

It is not my intention to place blame on the drop-forged concerns, nor to criticize their methods; they, too, are up against conditions that have never before existed in the history of the industry, and are necessarily dependent in their turn upon the steel manufacturers. All companies doing forge work of this kind have been working to the limit of their capacity and have been turning orders away.

Not only here, but in foundry work, are serious delays encountered. Foundries are so rushed that errors are made, and the rigid inspection system obtaining in our plant causes a great many castings to be rejected. This is undoubtedly the case with other manufacturers in our line. Delivery of accessories and the quality of the products is also uncertain, and the accessory manufacturers, owing to the curtailment of imports brought about by the war, have been obliged to substitute for materials which hitherto have come from the other side. However, they have gone about it manfully and I, for one, think the lack of supplies from Europe has been the best thing that could have happened. Given time, we shall be entirely independent of any other country in bringing out our best products. Our accessory manufacturers should therefore be encouraged, especially where they are following up their products in service and are making corrections when necessary.

It is in spite of the difficulties enumerated above, therefore, that the American marine engine has improved in quality and increased in quantity. With the industry on a firm footing I feel confident that we are in shape to go to it for 1917 with troubles of imperfect material and workmanship a memory of the past.

As a sport, motor boating is supreme, and it attracts a clean, healthy following. For the last few years it has been held back somewhat by the universality of the automobile. But, despite wonderful cars and wonderful roads, automobilizing can never really compete with motor boating now that the marine engine has been brought to a corresponding state of perfection. I look forward to 1917, firm in the belief that it will be the greatest year motor boating has ever seen.

Yard and Shop

(Continued from page 59)

as much room fore and aft (which is what counts on a small boat), and they afforded a convenient aisle through the center instead of two narrow passages around the single engine. When the dual power plant was opened up, the runabout ran beautifully and made an actual speed of over 19 m.p.h.—more than a mile better than was obtained with the single engine.

As to the cost, both first cost and operation, the two Gray D's were found to be cheaper in both instances. By manufacturing Gray motors in great quantities the Gray Motor Co. can furnish two motors of the highest quality at a lower price, it is said, than one good 50 h.p. motor can be purchased for. In fuel consumption, too, the twin installation won out, for the two motors consumed less gasoline per mile than did the single unit, while it was found that the twin-screw outfit caused less vibration than the single large motor.

New Yacht Brokerage Firm

J. Montgomery Strong and Frederick W. Bickmann have established offices at 42 Broadway, New York, under the firm name of Strong & Bickmann, where they conduct a general yacht and ship brokerage business. Mr. Strong is a well-known New Yorker, yachtsman and member of the New York Yacht Club, while Mr. Bickmann's life work has been in the yachting line. He has been associated with the foremost concerns in the business, and there is hardly a yachtsman unknown to him. Both members have established reputations for honesty and fair dealing which should assure the success of the firm. Since this firm started on August 1, business has been very good, and we are informed that the outlook for the future is particularly promising.

The Jacobson Semi-Diesel

One of the illustrations on page 59 shows the Jacobson two-cycle semi-Diesel, which is a newcomer in the marine field. This engine is manufactured in various powers up from 7½ h.p. by the Jacobson Motor Co., of Saratoga Springs, N. Y. It is of the two-cycle type and works under comparatively low pressure. Fuel economy and accessibility are two of the prominent features of this job.

The Standard Oil Engine

Another semi-Diesel motor, which was recently announced, is the Standard Oil, built by the Standard Oil Engine Co., of Bridgeport, Conn. This is a four-cycle machine of thoroughly modern design and construction, and it is built in fourteen sizes, ranging from 8 h.p. up to 150 h.p. The engines are of the vertical single-acting type and use fuel oil or kerosene for fuel. They are started by means of compressed air, low pressure tanks being charged from a small auxiliary compressor working off the crankshaft. No high pressure air is used. Motors of this type are less expensive in first cost than those of full Diesel construction, and are declared to be extremely simple in operation.

New Construction Concern on the Coast

It is no secret to men who are interested in shipping affairs that the present war has brought about a tremendous revival in the shipping industry and in the building of large and small boats. In New England, windjammers which had been practically retired to the boneyard have been resuscitated and drafted into transatlantic service, while almost every craft which had a sound keel and could carry a suit of sail has been pressed into some sort of work.

The Pacific Coast has also felt this revival, and many concerns have been established for the purpose of building new craft and keeping up with the existing demand for boat yards. One of the most recent of these is the Oregon Shipbuilding Co., of Portland, Ore., which is capitalized at \$200,000 and plans, as its initial work the building of three five-masted schooners. Of course, the interest which these vessels will have for motor boatmen lies in the fact that they will all be powered with auxiliary marine motors. In including power in the equipment of these schooners, the company tolls another stroke in the knell of the out-and-out sailing vessel. No longer can any reasonable argument be advanced against the installation of power in sailboat, whether she is to be used for pleasure or commercial purposes, while the list of advantages which accrue from the supplementary use of motor power grows longer with every vessel so equipped.

Gene V Stock Boats

The Gene V Boat Co., of Cincinnati, O., as the boat building department of the Motor Boat & Auto Supply Mfg. Co. is now designated, has one of the most extensive lines of stock boats in the field today. Unfortunately, this line was not sent us in time to be included in the tabular matter which we have devoted to stock boats in the present issue, and so we must content ourselves here with a short general account of the types and styles of standardized boats offered by this concern. The line divides itself into boats of practically every type, and there are several models of each type. First of all there are the sea runabouts in five different lengths ranging from 18 to 28½ feet and varying in speed from 10 to 26 m.p.h. Then there are the fast runabouts and the express runabouts which together offer a choice of seven lengths from 16 to 26 feet and a speed range from 16 to 33 m.p.h.

The 30-foot special is put out in three different models which vary slightly in beam measurements and amount of power installed. There are three mono-hydrplanes, 16, 17 and 19 feet in length, respectively, which give one the option of owning a boat having from 7 to 50 h.p. The dispatch runabout, 16 feet in length, is an attractive proposition which, with 12 h.p., gives a speed of 22 m.p.h. The Gene shoal boats in four models with a maximum of 20-foot length will appeal to those who are obliged to navigate in shallow water, and the Viper V-bottom runabouts embrace a sufficient number of models to satisfy the predictions of the prospective purchaser who favors this type of hull construction. The Viper V-bottom class also embraces eleven different sizes of cruisers, which range in length from 28 to 65 feet, and there are six different sizes in the Gene V raised-deck cruiser models.

Completing the line of cruising boats are seven models in the bridge-deck type, the shortest of these a 32-footer with 15-mile speed, and the longest a 60-footer vessel with a speed of 20 m.p.h. All of them offer good cruising radius and the ability to get there and back in a very short time.

In addition to the above this company turns out three carvel-built outboard motor rowboats of 14-, 16- and 18-foot lengths, and also builds a representative line of man-powered rowboats.

Busy Year for Homer

Although 1916 has been a banner year for the marine engine manufacturers, and has included Arthur P. Homer, of Boston Mass., who distributes Sterling engines in the New England district, this enterprising distributor expects an increase for next year of at least 1,500 h.p. in his total sales. Mr. Homer reports a total of 6,500 h.p. for the 1916 season, beating 1915 by 1,399 h.p. Among the prominent purchasers of Sterling engines from Mr. Homer are the United States Coast Guard and the United States Navy. The Coast Guard bought six of the Model F 4's for use in its standard 46-foot life boats, and the Navy required seven Model F 6's for use in its regular 35-footers. Geo. Lawley & Son, Inc., have also been good customers, while a list of private owners who have specified Sterling motors for their craft is an unusually imposing one.

(Continued on page 120)

Announcement



Driggs Ordnance Co., Inc.

Marine Engines—Naval Guns

Watch Next Issue



GASOLINE—KEROSENE

Peerless

MARINE MOTORS

Announcement

We are pleased to announce the new 5 to 8 H.P. Single Cylinder and the 10 to 12 H.P. Two Cylinder Models. These engines are designed to meet the hardest kind of service such as is encountered in Fishing and Work Boats. The design throughout is extremely simple, strong and accessible. They are in every way a work a work engine. In accordance with the Peerless Policy we are offering these engines at a popular price.

1917 PRICES Fishing and Work Engines

1-cyl. 5 to 6 H. P. Complete except Reverse Gear	\$165.00
(Reverse Gear on exhaust base \$25.00 extra.)	
2-cyl. 10 to 12 H. P. Complete ex- cept Reverse Gear	\$250.00
(Reverse Gear on exhaust base \$40.00 extra.)	
2-cyl. 20 to 24 H. P. Complete with Reverse Gear	\$425.00
4-cyl. 40 to 50 H. P. Complete with Reverse Gear	\$675.00
MEDIUM DUTY AND SPEED ENGINES	
2-cyl. 8 to 10 H. P. Complete with Reverse Gear	\$280.00
4-cyl. 16 to 20 H. P. Complete with Reverse Gear	\$395.00
4-cyl. 25 to 35 H. P. Complete with Reverse Gear	\$475.00

"Popular engines at popular prices" is the policy which has brought the Peerless to the front with rapid strides in the last three or four seasons. There is nothing cheap about this engine except the price, and that is cheap when you consider the quality of design that goes into it, and the quality of service that comes out of it.

Standard Medium Duty, Heavy Duty and Speed Models

Peerless engines are making good in fishing boats, runabouts, cruisers, tugs and work boats of many sizes and types. They are all four-cycle engines, with big bearings, heavy crankshafts and all parts of ample size to stand up under continuous severe service.

Get our catalog and study Peerless construction and Peerless prices. If you have a friend who owns a Peerless, ask him what he thinks about it. Note the high-grade equipment and accessories we furnish. Investigate the whole Peerless proposition as searchingly as you wish. We will help you.

If your investigation is impartial, we will be satisfied with the result.

PEERLESS MARINE MOTOR CO.
2150 NIAGARA STREET, -:- BUFFALO, N. Y., U. S. A.



HAND V-BOTTOM BOATS have created a new standard of efficiency in the boating world. Their many achievements entitle them to first consideration from anyone—either the amateur owner or professional builder—who is interested in building any size of motor boat from a 15-ft. runabout to a 65-ft. express cruiser.

HAND V-BOTTOM BOATS are all of an original and distinctive type of design which gives a boat that is easy to build, staunch, seaworthy, dry, handsome in appearance and very fast for its power.

As a matter of fact, the V-bottom idea is revolutionizing an art almost as old as civilization itself—the art of boat building. It is radical without being impractical, different without being freakish, economical without being cheap.

Hand V-Bottom designs are equally valuable for the most expensive built to order boats, and for economical manufacturing on a quantity production basis. So many exceptionally successful Hand V-Bottom boats have now been built that the prospective buyer or builder can usually be referred to an actual boat which incorporates his requirements of size, speed, plan, appearance, etc.

Full detailed building directions, working plans and specifications of many stock designs up to 55 feet can be had at prices of \$7.50 to \$40.00. Special designs based on percentage of building cost. Complete boats also built under the direct supervision of Mr. Hand.

Handsome 48-page Illustrated Catalog Free Upon Request

WM. H. HAND, Jr., Naval Architect New Bedford, Mass.

Entrust Your Life TOPPAN BOAT



Toppan Boats are designed and constructed by the born boat builders of the Massachusetts coast. With them the building of good reliable boats is a hereditary trait. They just can't help it.

Still Toppan Boats are up-to-date in appearance, well proportioned and handsomely finished.

You can entrust your life safely to a Toppan Boat. It will never fail you.

Toppan Dories are largely used on the fishing banks. For safety and seaworthiness in design and construction they have never been excelled, and seldom equalled. The same qualities are built into all Toppan models.



Dories—Runabouts—Cruisers

DORY LAUNCHES—18, 20, 22, 26 and 30 ft.
SAILING DORIES—14, 16, 18 and 21 ft.
V-RUNABOUTS—14, 21, 27 and 30 ft.
GOV. MODEL LAUNCHES—22, 26 and 30 ft.
FISHING DORIES—18, 20, 22, 26 and 30 ft.

ROWING SKIFFS, SWAMP-SCOTT DORIES.
RAISED DECK CRUISERS—27 and 30 ft.
SPECIAL OUTBOARD MOTOR BOAT—850 and up.
Special CAFE CAT SAIL BOATS—21 and 34 ft., with or without power.
SAILING DORIES—14 ft. up.
ROWING SKIFFS AND DORIES.

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When writing to advertisers please mention MOTOR BOATING, the National Magazine of Motor Boating.
Advertising Index will be found on page 60.

Yard and Shop

(Continued from page 116)

De Forest Gives Regular Concerts

For the benefit of amateur wireless operators, ashore and afloat, the de Forest Radio Tel. & Tel. Co., of New York, has been giving occasional musical concerts, furnished by wireless telephone, from its laboratories at High Bridge, N. Y. For some time in the future this pleasant service will be extended, and nightly at 8 o'clock the company will transmit wireless music at an approximate wavelength of 800 meters. On November 7, the re-election of President Wilson and various other details of the national election were also sent out by the de Forest wireless telephone.

Specifications for Army Hydroaeroplanes Show Advance Made in Aeroplane Construction

(Continued from page 12)

THE tremendous progress made in aeroplane construction can be seen from the specifications just issued by the Aviation Section, Signal Corps, U. S. Army, for twin-motored hydroaeroplanes for coast defense. It will be recalled that the very first flight made from the water—that is, when an aeroplane, equipped with floats, rose from the water and returned to it without mishap—was made only as long ago as 1911, by Glenn H. Curtiss. Equipping an aeroplane with two motors was still considered such a difficult problem in 1912 that the \$15,000 prize offered by Edwin Gould for a contest for twin-motored aeroplanes was not won.

The specifications state that the machines shall be two-place biplanes or triplanes, with power plant consisting of two motors and two propellers, and the machines will be required to carry a useful load comprising the following:

(a) Pilot and one other, 330 pounds.

(b) Supply of gasoline, oil and water necessary for a flight of five hours' duration, with motors turning continuously the number of revolutions per minute required for their rated horsepower.

(c) Instruments and equipment, 150 pounds. (Note: For calculations for longitudinal balance and statical stability, it will be assumed that the moments of these masses forward and aft of the center of gravity are equal.)

The specifications continue:

Unless otherwise specified, the useful load carried on all performance and maneuvering tests shall be equivalent to the above.

The rated horsepower of the complete power plant, consisting of two motors, shall be between 170 and 300. Looking from the rear, the right-hand propeller shall turn counter-clockwise, and the left-hand propeller shall turn clockwise.

The horizontal low speed shall not exceed 45 miles per hour.

The aeroplane shall be capable of a sustained flight of six and a half hours, carrying pilot and one other.

The aeroplane shall be capable of arising from the water in flight while running before a wind of 5 to 7 miles per hour, with load as stated above, in a period of time not greater than one minute and thirty seconds from the time full power is applied, with machine practically at rest.

It shall be capable of getting off in smooth water and calm air in a run of 1,000 feet.

Airworthiness.—The airworthiness and general flying qualities of the aeroplane shall be satisfactory to the inspector.

A pilot employed by the manufacturer may be required, at the discretion of the inspector, to perform the following maneuvers:

(a) Dive with longitudinal axis of the aeroplane at an angle of at least 50° to the horizon and hold this approximate angle for between one and two seconds, then pull out reasonably quickly.

(b) Make steep banks to right and to left.

Among desired flying qualities are included celerity of response to control; the proper degree of symmetric and asymmetric stability (static and dynamic); steadiness in disturbed air, under various flying conditions.

In order to determine these attributes, an Army pilot may, at the discretion of the inspectors, fly any or all machines, executing sharp "figures of eight," dives, stalls of various kinds, side slips, sudden stopping of motor while climbing steeply, releasing of controls for a period of time after the machine has been steadied in horizontal flight, and such other maneuvers as he may deem necessary to determine the general suitability of the machine.

Maneuvering on the Water.—Maneuvering ability on the water shall be satisfactory to the inspector.

The aeroplane shall be susceptible of being driven on the water in a straight line in any direction with respect to a wind of velocity up to 15 miles per hour.

The aeroplane shall handle satisfactorily in a choppy sea, in waves 3 or 4 feet high, from crest to trough.

It shall show no marked tendency to "porpoise" either while landing or getting away in a calm sea or in a wind of not less than 12 miles an hour, the wind being either ahead, abeam, or astern.

It shall be capable of being turned on the water in "figures of eight" within a rectangle 1,400 by 600 feet.

The aeroplane shall be capable of turning to the left or to the right, starting the turn while running at full power either before or into a wind of at least 12 miles per hour.

It shall be capable of being landed before a wind of at least 15 miles per hour without danger of nosing under.

It shall be capable of getting off the water without injury to the floats in a 25-mile wind with waves 3 or 4 feet high, from crest to trough.

It shall be capable of being landed in a cross wind of at least 10 miles per hour without injury.

Seaworthiness.—The machine shall not show undue tendency to capsize on a skidding landing or when running at high speed on surface with moderate wind and sea ahead.

The aeroplane when adrift with dead engines shall normally head into the wind.

It shall permit of being anchored for not less than one-half hour in open water in wind of velocity not less than 25 miles an hour without material damage. A sea anchor shall be used for this purpose.

The general arrangements, including design of floats, shall be such that the tail planes are held clear of the water when the aeroplane drifts astern in a wind velocity of not less than 25 miles an hour.

The arrangement shall be such that when taxi-ing in a moderate sea the propellers are not unduly subjected to the action of the spray.

The aeroplane shall be supplied with suitable bow chocks and cleats or other suitable means for towing or mooring.

Controls.—Controls shall be of the standard Deperdussin type, installed in the rear cockpit only.

The action of the control shall be positive, reliable, and such as to give the proper power ratio.

The lateral control flaps shall be double acting.

Stabilizer.—Aeroplanes designed for and provided with automatic controlling devices of approved type will be favorably considered. The use of a lateral stabilizer is especially encouraged. Positive, quick, convenient, and reliable means shall be provided to permit the pilot to cut out any automatic stabilizer. (Note: The additional cost of the stabilizer installation shall be stated in the proposal.)

Protection.—All material, parts, instruments, and accessories of aeroplane and power plant which will suffer either in material or in functioning from dampness and exposure to salt water must be satisfactorily protected therefrom.

Any provision possible should be made that will render any vital portion of the aeroplane or power plant structure relatively invulnerable to the fire of small arms or shrapnel, without material sacrifice in the design, strength or weight.

Power Plant.—All motors furnished under this contract shall show proper functioning at all heights from sea level to 7,000 feet.

The vibration initiated by the power plant at any normal speed of revolution shall not be excessive. This will especially apply at the normal speed of motor operation.

Field of Vision.—The field of vision of pilot and observer shall be satisfactory.

This will be indicated on the prints submitted with the bid.

From
"Optional"
 to
"Standard"

The Berling Magneto has won its way to the hearts of thousands of good gasoline engines, in the air, on the water, and on land.

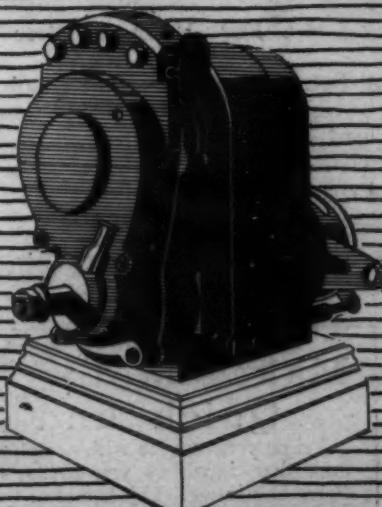
Especially on the water—where the Berling Magneto was at first only "optional" equipment, it is now "standard" on many of the best marine motors. For, the Berling has made good on the Sterling, Van Blerck, Universal, Winton, Wisconsin, and many other makes.

If the Berling is not standard on the next marine motor you buy, ask for it. It costs you not a cent more.

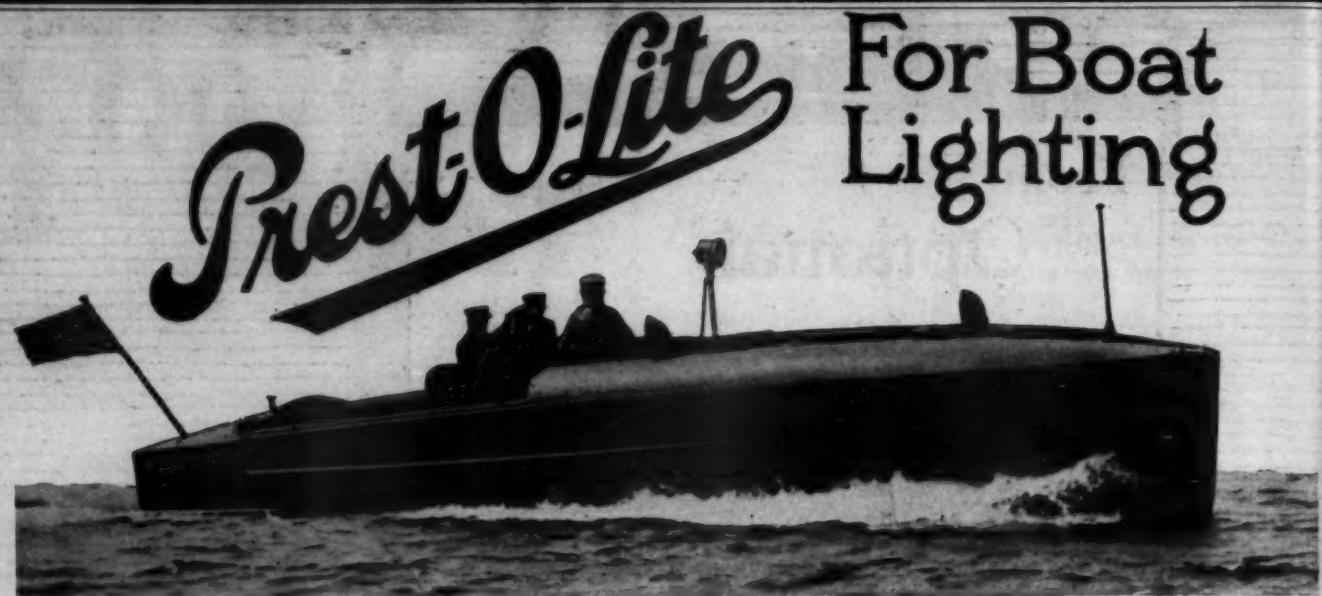
BERLING MAGNETO

WORTH MORE

DOES MORE



THE ERICSSON MANUFACTURING COMPANY
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 Buffalo, N. Y., U. S. A.



For Boat Lighting

Nothing is so important to the successful operation of the electric starting and lighting system on your boat as its storage battery. In fact, the battery is the very heart of the system.

If you are to get real service and satisfaction from that system, it will pay you to see that your storage battery is reliable and efficient and that it is backed by a service you can *use*—when you need it and as often as you need it. For the best of batteries need the best of service.

Get a battery that will insure you this service—

Prest-O-Lite Storage Battery For Your Electric System

Not only is this a better storage battery—it has proved its superiority over other types through long periods of hard service—but it is backed by Prest-O-Lite Service which gives you expert battery service through the many Prest-O-Lite service stations and direct factory branches located throughout the country.

Let us send you full particulars regarding this better battery and the service back of it.

Makes Motor Starting Quick and Easy

Prime your engine with acetylene, from the same tank that furnishes you lights, by means of the Prest-O-Primer. This is one of the easiest, quickest and most economical ways to start a cold engine of any size. Send for special folder.

No boat is so small or large that it cannot be fitted throughout quickly and at low cost for the use of Prest-O-Lite Dissolved Acetylene.

Its use on your boat provides many decided advantages. It is perfectly simple, easily understood and operated, and has proven its dependability and economy through years of satisfactory service.

Many of America's best pleasure boats are using it today. Your boat can be inexpensively equipped throughout with

Prest-O-Lite Acetylene Lighting For Your Gas System

It furnishes an abundance of light for all purposes—for searchlight, cabin and signal lights. Also easily used with various appliances, which we furnish at small cost, for cooking and engine priming. In addition, Prest-O-Lite acetylene provides a quick, low-cost means of effecting soldering and brazing repairs on your boat.

Complete information on any or all of these points sent free.

Every boat owner, builder or buyer will be interested in our literature describing fully the Prest-O-Lite Battery and Prest-O-Lite Acetylene. Send for either, or both—free on request.

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The World's Largest Makers of Dissolved Acetylene

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Backed by Prest-O-Lite Service

OBERTDORFER

Let Us Furnish

Finished Bronze

BUSHINGS

Bronze Geared

PUMPS

This is the age of specialization.

The workman who by constant effort, develops his ability in one operation becomes more proficient than the workman who performs that operation only occasionally.

The manufacturer who concentrates his whole energy and organization on a certain product, is more efficient than the manufacturer to whom that product is a mere detail.

We are specialists in the production of Finished Bronze Bushings. We have put more than forty years of experience and honest effort in this work.

Oberdorfer Bushings and Bearings represent the highest degree of efficiency in bushings production. We say "Efficiency" because this embraces Quality of Materials, Accuracy of Workmanship and Economy in Manufacture.

Engine manufacturers will find that we can supply them better bearings for less money than they can secure elsewhere.

Estimates furnished upon receipt of blue-prints.



Oberdorfer Pumps are ideal for regular equipment on all sizes and types of marine engines. For circulation of water, lubricant, fuel, or as bilge pumps, there are no better or more reliable pumps on the market.

Oberdorfer Circulating Pumps are used on

Loew-Victor, Lockwood-Ash, Morris-town, Fairbanks-Morse, Scripps, Erd, Red Wing, Gray, Lamb, Smalley, and other well-known engines. They are preferred for three particular reasons—

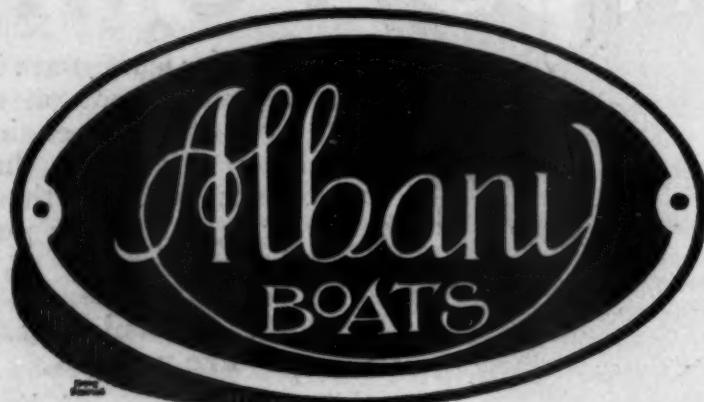
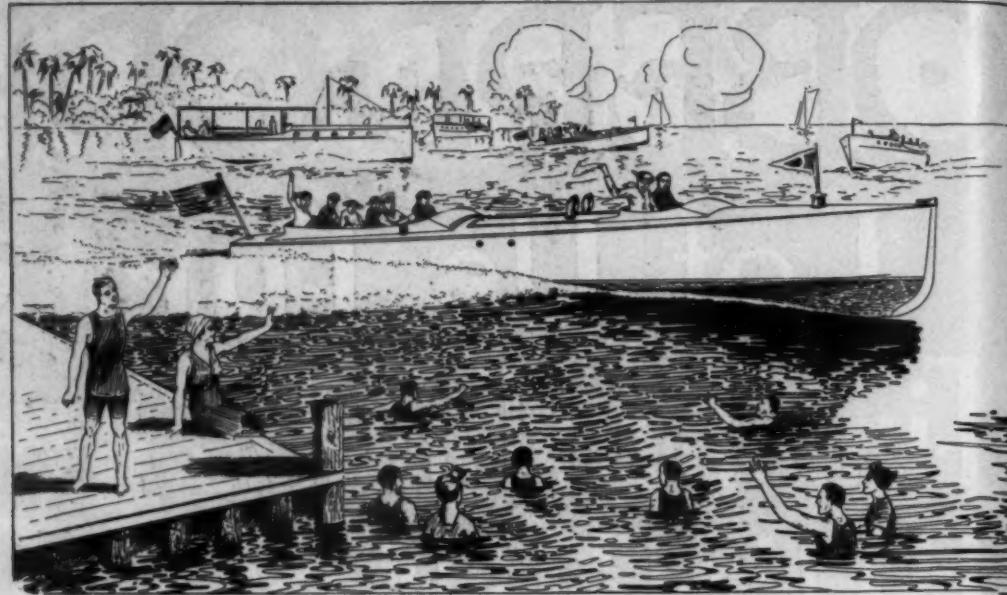
1. They distribute water in exact proportion to engine speed.
2. Give a positive pressure always.
3. Lift water three feet without priming.

The pump shown below is our Type AXZ, manufactured especially for forced lubrication.



Write today for the Oberdorfer Book and prices.

M. L. OBERDORFER BRASS CO.
820 East Water Street Syracuse, N. Y.



Get An Albany Boat For the Sunny South

THE sunny South is a land of luxury—the southern season a time for unalloyed pleasure.

A motor boat is essential of course. And it must reflect the atmosphere of luxury. It must be so perfect in every appointment that nothing can mar the enjoyment of the season.

Albany Boats are just the thing for Southern use. They are the finest boats that can be built, excelling in design, construction, finish and equipment. Beauty and luxury are expressed in every detail.

Our winter service station at Miami is an important consideration but even more important is the fact that we are specialists on fast boats, combining speed, seaworthiness, comfort and reliability.

We have several fine express cruisers and many fast runabouts now under construction. A cordial invitation to visit our plant is extended to everyone interested in boats of this class.

Express cruisers for Florida should be ordered at once. If you want a 30 or 35 m.p.h. runabout, remember we carry them in stock.

Let us send you a catalog. Mention whether you prefer a cruiser or runabout.

ALBANY BOAT CORPORATION
7th Street, Watervliet, Albany, N.Y.

20 minutes by trolley from Albany Union Station.

**9-12 H.P.
4 Cylinder**

**Universal
4 Cycle
MARINE
MOTOR
1917**

**Universally Adapted to 80% of the Boats Now in Use
(80% Covers Boats from 14 to 30 Ft. in Length.)**

IF your boat ranges between a 14 ft. launch and a 30 ft. cruiser, the 1917 Universal De Luxe is just the motor for you. It is the one motor that will give you the most service, speed and satisfaction for the least money. It is the highest grade motor of its size and price that can be built.

Perhaps you have almost decided on another motor. But stop before you go any further and study the Universal. Study the few details we are able to present in this advertisement. Write us for a more complete description. And give us an opportunity to show you what other Universal owners think and say.

You'll find the newest and best features of marine motor design in the new Universal. Notice the neat block cylinder casting with detachable head. Inlet and exhaust manifolds are cast integral with the cylinders,—cooling the exhaust, heating the intake and making a cleaner, quieter, cooler and more economical motor. The crankshaft is short, heavy and sturdy. The bearings are amply large. We have a superior system of lubrication which insures long service by minimizing the effects of wear.

By building only one model and building it in quantities we have been able to cut the price right down to the minimum. But the motor was not designed to meet the price. We produced the best motor that anybody could want, then planned a production that insures economy in manufacture.

The past year of successful service and repeat orders from boat builders, and the fact that each motor is guaranteed to please, should be sufficient for you to positively decide that the Universal is the motor for you.

**Write today for
Bulletin No. 25**

**Universal
Motor Co.**

Oshkosh, Wis., U. S. A.

9 to 12 H. P.

1200 to 1600 Revolutions

Speed Range 300 to 1800 Revolutions

EQUIPMENTS SUPPLIED

Equipment C1—Includes water pump, carburetor, ignition system, controls and front starter.

Equipment C2—Includes above with reverse gear and coupling.

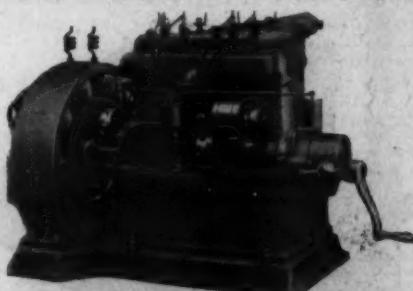
Equipment C3—Includes C2 with rear starting attachment.

Equipment C4—Includes C3 with full propeller equipment.

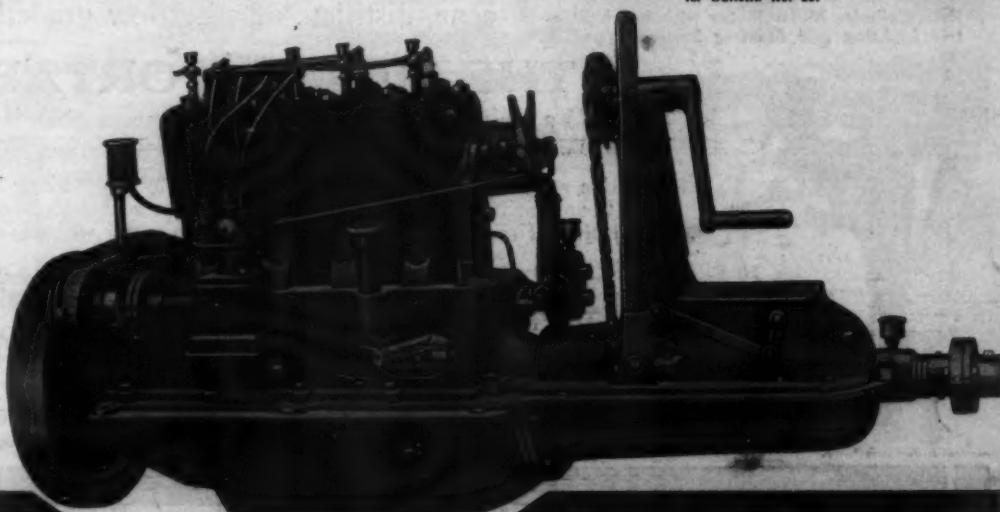
Equipment C5—Includes C4 with front starter instead of rear starter.

Electric Starter and Kerosene Attachments Optional

Owing to the advance in the cost of labor and prices on raw materials, we find it necessary to advance prices of our marine motors. Advance will go into effect January first. All orders received prior to that date will be filled at the old prices.



4 k.w. direct connected generating sets used by U. S. and foreign governments, and admirably adapted to Naval Fleet Boats and all boat lighting. Operates searchlight, boat lighting, wireless and cooking plants. Send for Bulletin No. 26.



*When writing to advertisers please mention MOTOR BOATING, the National Magazine of Motor Boating.
Advertising Index will be found on page 60.*

MOTOR
BOATING

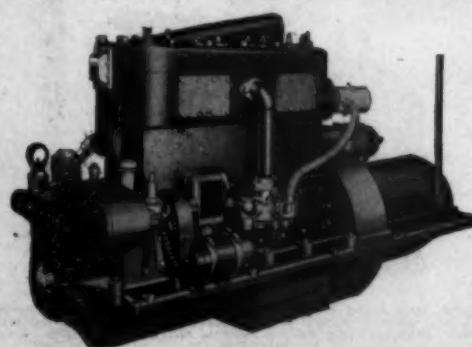
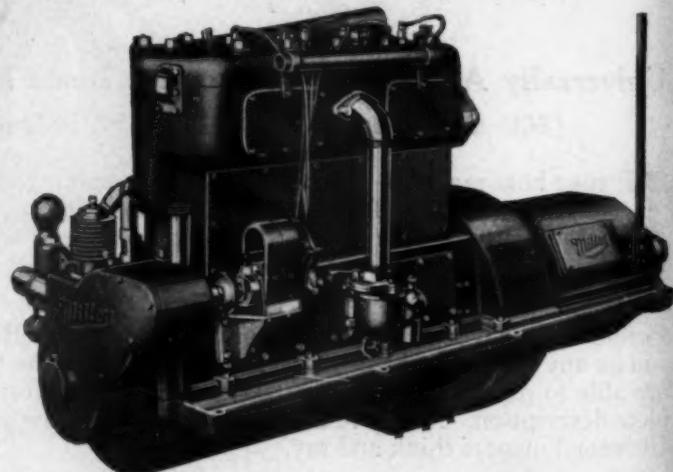
Time-Tried, Tested and Not Found Wanting

If you want a medium duty or heavy duty power plant that is backed up by many years of successful service, get a Miller Motor. There are more expensive engines and more widely advertised engines, but there isn't a better built one. We have always striven for quality, not quantity, of output.

Miller prices represent 100 cents' worth of engine value to the dollar. We haven't the tremendous overhead expense of the big factories. Still we manufacture enough motors to secure economy in production. When you know the reliable quality of Miller Motors, the prices will speak for themselves.

If you want 4 or 6 H. P., you will find the one-cylinder Miller F-1 and I-1 models hard to beat. They are high grade four-cycle engines, and we haven't skimped the quality because they are our smallest models. We build three two-

cylinder vertical models, from 8 to 15 H. P., also five double opposed motors.



Four-Cylinder Miller Motor with Bosch Electric Lighting and Starting System Installed.



2 1/4 H. P.
Bore 2 3/8".
Stroke 2 1/4".
Ignition by
Battery or
Bosch or Dixie
High Tension
Magneto.

Miller Four-Cylinder Motors are built in eight models, from 10 to 75 H. P. They are the very best in design, materials, workmanship and equipment. We use the Bosch Duplex Magneto and Bosch-Rushmore starting and lighting system.

Miller Motors are designed to operate at 350 to 1000 R. P. M., depending upon the class of duty. Furnished for burning kerosene, distillate or other low grade fuels, if so specified in order.

THE MILLER PORTABLE MOTOR

Here is a strictly high grade outboard motor that is actually better built than most motors of its price and type.

Positive reversible weedless propeller, operated by the steering lever. The movable blades are adjustable to any pitch, thus automatically providing for a variable speed in either direction. This gives the perfection of control which is so desirable in a motor which is usually operated by inexperienced boatmen.

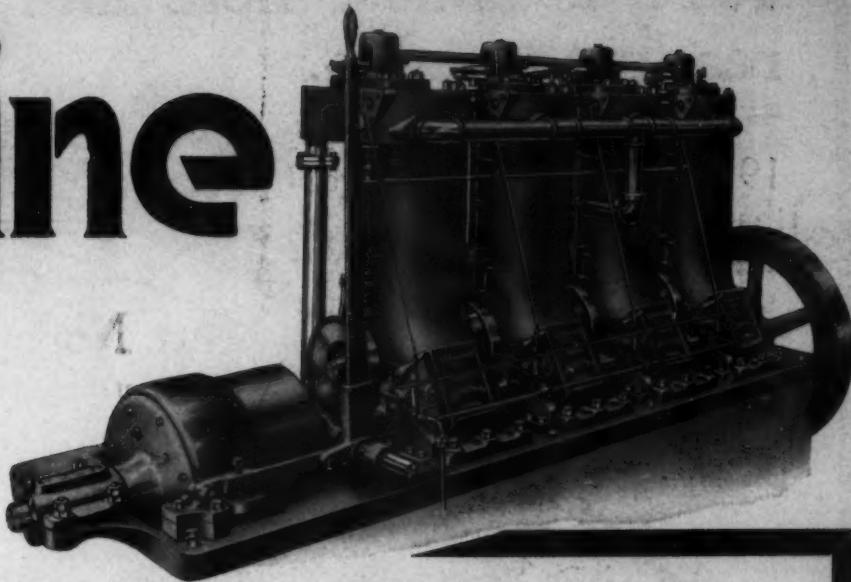
Write today for latest illustrated catalog which describes the entire line of Miller Motors.

MILLER GAS & VACUUM ENGINE CO.
2329-2331 North Talman Ave. Chicago, U.S.A.

Agents: Consolidated Gas & Gasoline Engine Co., 202 Fulton St., New York City
Sole Agents for Australia: A. J. Dadson & Co., 9 Hamilton St., Sydney, N. S. W.

Standard Oil Engine

Semi-
Deisel



80-100 H. P., 4 cylinder, 4 cycle, 9 x 12" Standard Oil Engine. Weight, 7500 lbs.

A strictly heavy duty engine, for the heaviest service in tow boats, freight boats, auxiliaries and large cruisers. It is a rugged, practical design, free from experimental features.

The first cost is reasonable.

The simplicity of design, construction, operation and maintenance obviates all troubles.

4 Cycle

8 to 250 H. P.

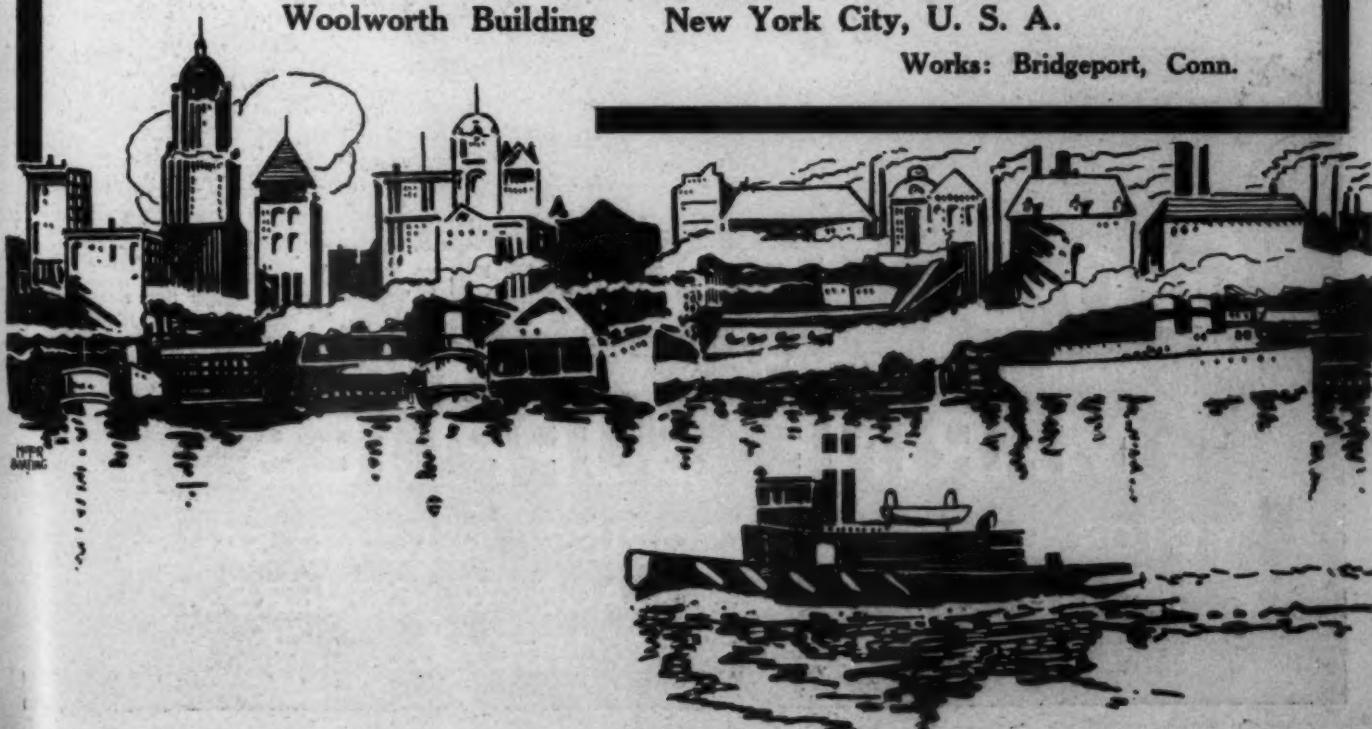
One to Six Cylinders

Write for further details

STANDARD OIL ENGINE COMPANY

Woolworth Building New York City, U. S. A.

Works: Bridgeport, Conn.



SHE'S COMING FAST

1917 is almost here and you can't get ready too soon.

The demand for goods during 1917 will be even bigger than it has been this year, unless all signs fail.

Send 20 cents for our big Marine Supply Catalog and make up your mind NOW what you will need next Spring.

The 20 cents is refunded on your first order.



GEO. B. CARPENTER & CO.

MANUFACTURERS & DISTRIBUTORS OF

MARINE SUPPLIES

MOTOR BOAT ACCESSORIES, RACING SAILS,
TENTS, AWNINGS, FLAGS & COVERS

440 WELLS ST. CHICAGO.

Caille PERFECTION Marine Motors

The
1917
5-Speed
Portable Motor,
perfected
and simplified,
is the
Master
Motor



The World's Largest
Builders of
Marine Motors

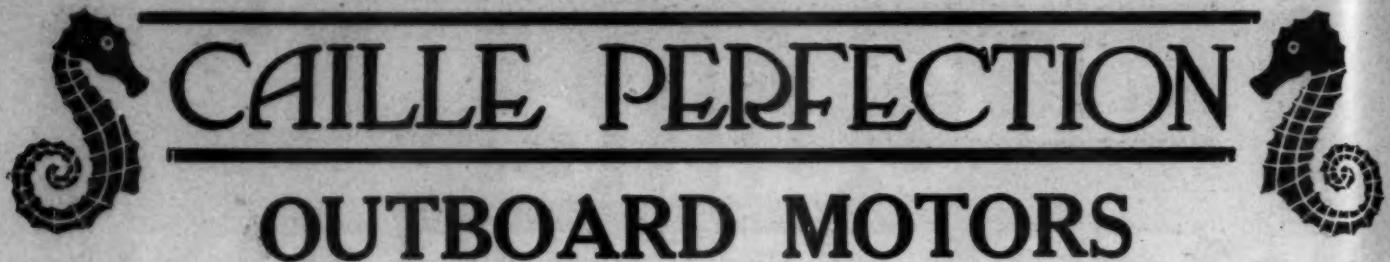
Our 14
H.P. 4-cycle,
4-cylinder Marine
Motor, standard
equipment, is the
WONDER Motor
of 1917.

Get particulars
and prove it.

YOU can now have a genuine Caille PERFECTION Motor in your boat, no matter what size or type it happens to be. From a little rowboat or canoe to a big cruiser or commercial boat, there isn't a single power requirement but is provided by one of the Caille PERFECTION models.

For years we were the world's largest builders of two-cycle motors, with a half-million dollar plant and a selling organization covering the civilized globe. Then we added our great five-speed rowboat motor, a snappy little canoe motor, and a wonderful four-cycle model that is the last word in engine perfection.

Study the Caille engines on the following pages—remember Caille production means maximum economy. If you want any further information or advice about your boat or engine, don't hesitate to write for



CAILLE PERFECTION OUTBOARD MOTORS



The Finest Outboard Motor Ever Built

There is no question about it. We deliberately set out to design the best outboard motor which could be built. We developed features which had never been thought of in connection with a portable motor before. We made it so simple and trouble-proof that a woman or child could handle it safely without previous experience.

The 5-speed feature is enough to make you decide on this motor instantly. It insures perfect one-hand control of the motor and boat under all conditions—more fun—greater safety—less work. But this is not all.

We eliminated cranking. A simple starter on the flywheel starts the motor with one pull. A small child can do it easily.

The flywheel contains a waterproof High Tension Magneto. The tiller is cushioned, to absorb vibration. The propeller is semi-weedless design.

Lubrication, cooling, silencing, attaching to boat—all these features and many others have been given special attention, and we didn't stop until each has been greatly improved.

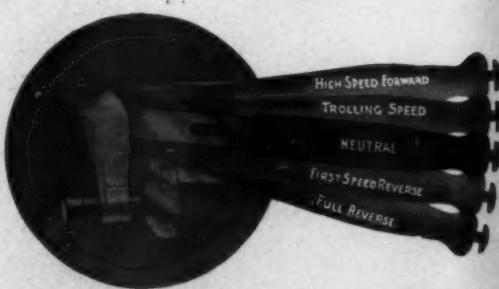
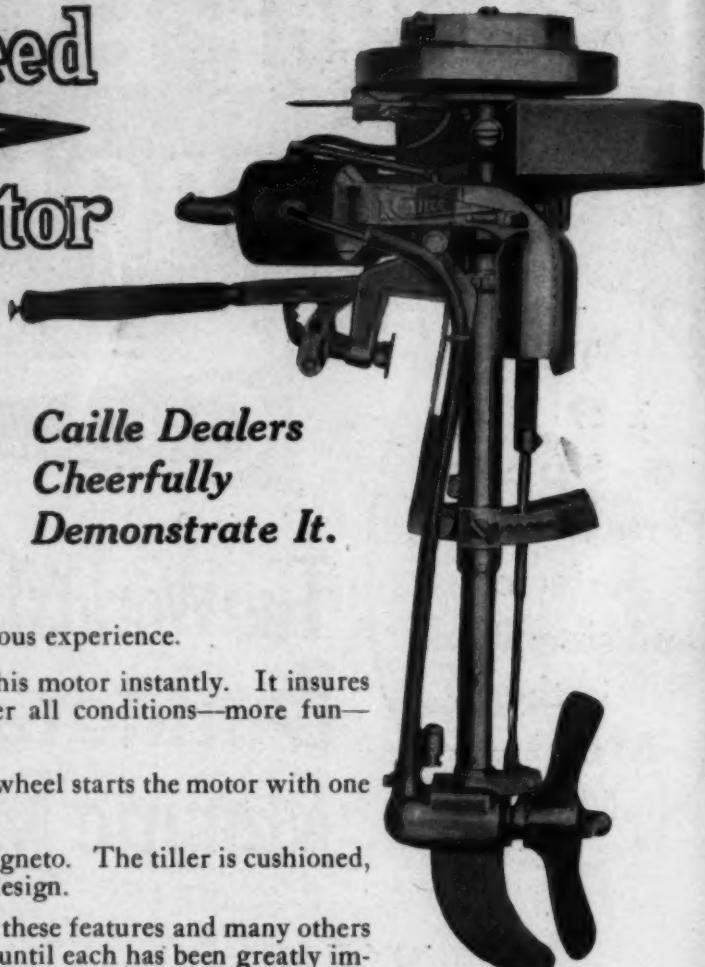
—and It's Built Right

There is only one way to buy a motor as the Caille buyer who demands the best. He also demands the finest workmanship. So we have given the Caille model the finest workmanship you can pay for.

The Caille Bantam— A Canoe Motor

For canoes,—the Caille Bantam is a high-grade little 2 H.P. inboard motor that gives a speed of 10 to 15 miles per hour. Designed especially for featherweight canoe construction, it is a wonder for lightweight and big power.

If you want a rowboat or canoe motor, don't buy any other. Study the Caille 5-speed or the Caille Bantam before you invest a cent.



Five Speeds—two forward, two reverse and neutral.
Improved Cooling.
Self-lubricating.
Weedless Propeller.
Water-tight Gears.
Press a button to change speed; press another to stop the motor.
Efficient Silencer.
Waterproof Magneto in the Fly Wheel.
Cushioned Steering Handle.
1 to 10 miles per hour.
Dual Ignition.

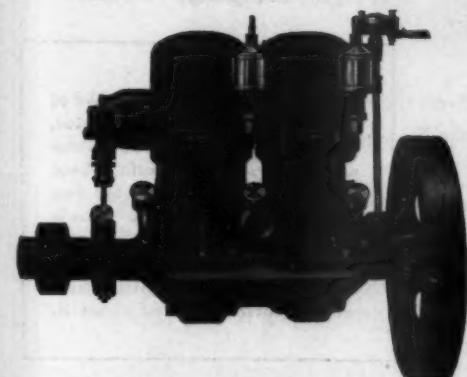




A Motor for Every Boat

THE Caille line of two-cycle engines is so big—so complete—that it is unnecessary for us to describe each motor individually here. Our famous "Blue Book" (sent free on request) does that. These motors range in power from 2 to 30 H. P.—1 to 4 cylinders. There are separate motors and unit power plants. There are heavy duty motors and high speed models.

The Place of the 2-Cycle



You can't get away from 2-cycle simplicity. For many purposes it is the most practical type, without question. It stands more abuse with less attention and less expense than any other. It costs little to buy and little to run. It is easy to handle and easy to care for.

There are two great arguments for Caille 2-Cycle Motors which no one can deny. The way they *run* and the way they *sell* prove their value. You'll find them in open launches, fishing dories, auxiliary sail boats and big cruisers the world round. They have been the foundation and backbone of our tremendous business for many years, and they're still going as strong as ever. Sold by hundreds of dealers throughout the world.

The single cylinder models are rated at 2, 2½, 4 and 6 H.P., and a special 8 H.P. Heavy Duty model for commercial and fishing boats.

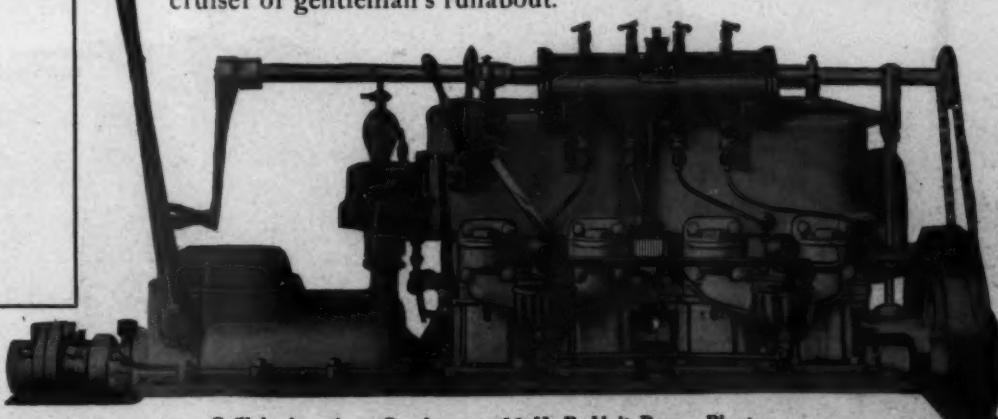
The double cylinder models are rated at 7-8 H.P., 14 H.P. and 18-20 H.P. Our 8 H.P. Unit Power Plant with integral reverse gear is the most perfect and most popular motor of this size and type ever built.

Four cylinder models are built in 16-18 H.P. and 30 H.P. The former is a Unit Power Plant.

Caille's American Gentleman—18 H.P.

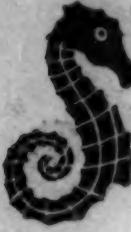
We have no doubt that this is the finest and most complete two-cycle engine outfit ever presented. It has a rear starter, rear controls, Bosch high tension magneto, multiple oiler, aluminum crank case and built in reverse gear.

It runs as smoothly and quietly as an 8-cylinder four-cycle and for all around quality and satisfaction we will match it against any four-cycle motor of its size in the world. Just the motor for a fine cruiser or gentleman's runabout.



Caille's American Gentleman—18 H.P. Unit Power Plant.





CAILLE PERFECTION



"ARISTOCRAT"

4 Cylinder

4 Cycle

14 H. P.

"Go the Limit" We Told Our Engineers—and They Did

WHEN we decided to build a four-cycle engine two years ago, imagine our position. We had a big going business so we didn't have to hurry. We had a well organized engineering corps. We had access to the best engineering brains in the automobile or marine industry, here in Detroit.

The ARISTOCRAT is all you could expect, even with this unusual combination of favorable circumstances. We have spared nothing to make it the finest medium size four-cycle power plant in the world. And we are satisfied that we have succeeded.

If you own a real high-grade and expensive automobile you will be able to appreciate the Aristocrat. If you own a big cruiser with a fine marine motor which cost several thousand dollars you will recognize the same qualities in the Aristocrat.

This motor is designed for the finest express runabouts and small cruisers. Any builder will install it for you. In some cases you may have to insist because we are selling the Aristocrat on a close margin.

We cannot begin to tell the whole story of the Aristocrat in this space. We have a special book that contains this story. *Write for it.*

WRITE FOR THE CAILLE LITERATURE

If you are interested in a certain type of boat we want to tell you about the motor we build for that boat. Our Service Department is organized especially to help you pick the motor that is best adapted to your purpose. It is at your service without charge.

Dealing with thousands of boat owners, builders and dealers the world over for fifteen years past, it is only logical that we have collected more information and data than any single owner could collect in a lifetime. All this—or as much of it as you need—is yours for the asking. Don't hesitate. Write today.

Electric Self-starter.

Electric Lighting Outfit.

Bosch High-tension Magneto.

Schebler Special Carburetor.

Splash Lubrication.

Nickel-plated trim.

Enclosed valves.

Weight, complete, 664 lbs.

We are building a single model of 4-cycle, 4-cylinder Marine Motor, 14 H. P., with or without reverse gear, and standard outfit, about which we should like to tell you more by correspondence. This is a plain, sturdy, first-class motor, dependable and speedy, at a price within the reach of the most modest purse. Ask us about it.

CAILLE PERFECTION MOTOR CO.

100 Baltimore Avenue, West

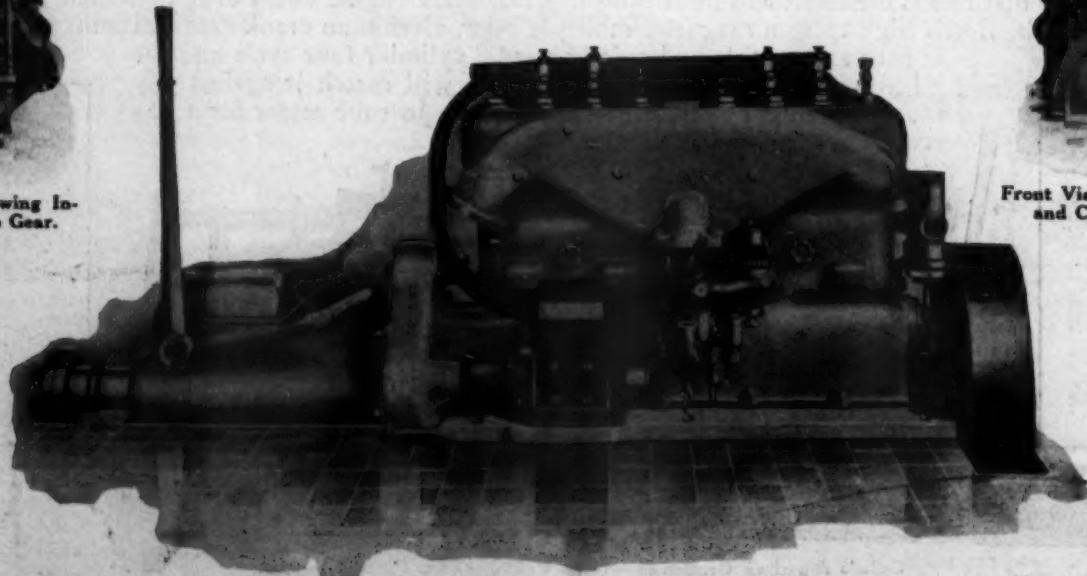
-3-

DETROIT, MICH.

Agents in All Principal Cities



Rear View Showing In-
tegral Reverse Gear.



Front View Showing Pump
and Cooling System.



NIAGARA

Runabouts



It is the ultra-refinement of Niagara Runabouts which makes them the foremost high grade stock boats on the market.

Niagara Runabouts compare with built-to-order boats as a Packard or Pierce-Arrow automobile compares with an experimental car.

The experiment is more or less risky and its cost prohibitive. The standardized design is tried and proven, and it can be built with maximum quality at minimum cost.

Neither luxury nor individuality is sacrificed in the Niagara boat, or the high grade car. In fact both qualities are enhanced because the standardization of the basic construction permits more time and attention for detail refinement.

Niagara Runabouts are manufactured in a well organized, modern plant, with every equipment and facility for good workmanship. We have the choice of the largest lumber stocks in the world. Every stick of wood or timber we use is hand selected by our own experts before delivery to our plant.

All boats are superbly finished in mahogany, and are provided with every equipment and accessory that is necessary or desirable for the convenience of the owner-driver.

The quality of Niagara Boats is indicated by the prominence of the owners who have purchased them. Among these are:

Mr. Percy A. Rockefeller, Standard Oil Co., N. Y.
 Mr. Jas. A. Stillman, National City Bank, N. Y.
 Mr. W. S. Benson, Vice-Pres. Tidewater Oil Co.
 Mr. Robt. J. Collier, Collier's Weekly, N. Y.
 Mr. Henry W. Darling, Treas., General Elec. Co., Schenectady, N. Y.
 Mr. Jos. J. Murphy, Troy, N. Y.
 Mrs. Whitelaw Reid, New York.

Niagara Runabouts are built in stock sizes of 20, 25, 28 and 32 ft. in length. All have ample beam to insure comfort and safety in any water. Details of equipment, arrangement and finish can be varied to suit purchasers. Speed according to power. Other sizes of open boats and cruisers are built to order.

We have several boats suitable for Southern use ready for prompt delivery. Write for catalog and information.

**NIAGARA
MOTOR BOAT
COMPANY**

210 Sweeney St.

North Tonawanda, N.Y.

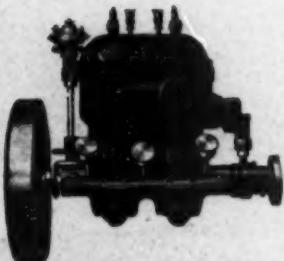


Start This Year Right—Build For The Future

OUR 18th ANNUAL ANNOUNCEMENT

THE name "EAGLE" applying to a Marine Engine is a guarantee of satisfaction from the standpoint of correct design, quality and efficiency.

We are to-day the largest producers of two cycle engines in America.



The Model 2K Eagle Marine Engine

We have a large line to choose from and offer a delivery service that will be a surprise to you.

Every indication points to 1917 as the greatest Boat Building Year in our history. The demand

for Engines will be enormous, the difficulties in manufacturing due to conditions existing in the raw material market will result in advanced prices. We urge our customers to place their orders early.

It appears almost useless for us after 18 years of continuous national advertising and with a business record unsurpassed, to place our merits before you for consideration at this time, nevertheless there are a few of the better class dealers that we feel should be associated with us and selling the most complete and up-to-date line of 2-cycle engines on the market.

The EAGLE is the popular priced line with excess power and excess value. You never did, and never will, purchase better value for your money than that offered you in every "EAGLE" ENGINE.

Therefore, we address ourselves to the live dealer, to the dealer who has an established business, who is sufficiently alert to grasp the importance of representing an established popular line and who realizes the importance and value of an association with an established house.

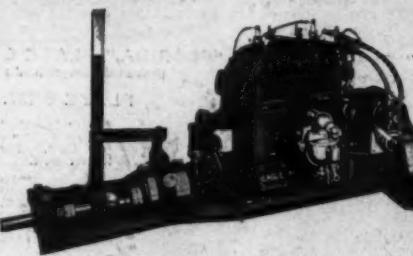
We want you to know that we are building our business on large lines. We insist on your receiving the best Engines at attractive prices; we insist that you get engines when they are wanted.

Yes, we are one of the pioneers in the marine engine field. "Eagle" engines have a record of making good and they are better to-day than ever. The more you have us build, the cheaper we can build them, and the less you will be obliged to pay.

Mr. Dealer and Mr. Builder, we want you to realize the importance of selling a quality engine. Stop working in a circle, have a purpose. Business without a purpose is "like a ship without a rudder." It's up to you to make good or you make way for the other fellow. Don't be "penny-wise and pound foolish." It's a penny-wise policy to sell questionable engines when you can sell one with a world-wide reputation. Associate yourself with a live organization. Handle "Eagles." Talk "Eagles," and you will appreciate the importance of what we are attempting to impress upon you.

Start the year 1917 right; build your business for the future. There is no profit for you if you are obliged to change your sources of supply on engines each year. Our most desirable and prosperous dealers are those who have sold Eagle Engines for periods of six to twelve years. They have made money in following this policy and we see no reason why any live and enthusiastic dealer or builder cannot do the same.

The Standard Company
Torrington, Conn.
U. S. A.



The Model 2 "O" Eagle Marine Engine
Unit Power Plant
This engine holds the world's record for speed.
Running at 1,300 R.P.M. (at which speed all
are tested), it develops 17½ actual H.P., mak-
ing it the most desirable engine for propelling
boats from 16 to 25 feet in length ever designed.



"SANDS" MARINE SANITARY FIXTURES

The World's Best Value in Marine Plumbing

Highest quality—Superior appointments—Longest efficient Service—
of installation and maintenance—First cost reasonable—Guaranteed
Prompt shipment.



"NATIONAL," PLATE S-2010.
(Patented—Copyrighted.)



"FLORIDA," PLATE S-2015.
(Patented—Copyrighted.)



PLATE S-2062
The "Angled" Composition
Ranged Sea Valves, with
straight couplings and locking
plate, for use on the
supply and discharge of small
pump closets.
Price per pair with
strainer for supply \$6.00



"HURON," PLATE S-2035.
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Equipment
Minimum
without
expense
reserve



"IOWA," PLATE S-2040.
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"MARCO," PLATE S-28.
(Patented—Copyrighted.)



THE "FRISCO," PLATE S-2046.
(Design Patented—Copyrighted.)



PLATE S-127.

The "Bradley"
Round Way
Cock. For
large closets.

	Price
1 Inch	\$4.00
1 1/2 "	5.50
2 "	7.00
2 1/2 "	11.00
3 "	16.00

The Superior
Appointments of These
High Grade
Closets Will Appeal to
Discriminating Owners

FOR USE ABOVE OR BELOW
WATER LINE



PLATE S-126.

The "Gleasons"
Composition flat
way sea cock.

1/4 Inch	Price
1/4 "	\$2.25
1 1/2 "	3.00
2 "	5.25
2 1/2 "	8.00
3 "	15.00

Plate S-2010 \$133.00
Plate S-2015 \$100.00
Plate S-2035 \$120.00
Plate S-2040 \$85.00
Any of the Above Closets—Pump White Enamelled, Nickel Plated Trimmings, Mahogany Wood—\$12.00
THE QUALITY, CONSTRUCTION, EQUIPMENT AND OPERATION OF "SANDS" FIXTURES
IS THE BEST IN THE WORLD

Plate S-2030 \$70.00
Plate S-26 \$100.00
Plate S-28 \$75.00
Plate S-2046 \$60.00

Plate S-34 \$52.50
A SPECIAL Plate S-2070 \$47.50
Plate S-39 \$45.00
Plate S-2061 \$20.00
Plate S-2050 \$30.00
Inlet and outlet of all pump closets are protected by "Sands" Patent Backwater
Check Valve and "Sands" Patent Automatic Safety Supply Foot Valve.

PLATE S-130.
The "Alton" Brass Inlet
Connection. Iron Pipe:
1/4 In. \$1.75
1 In. 2.25
1 1/2 In. 3.75

"MANOR," PLATE S-26.
(Patented—Copyrighted.)



"MOHAWK IMPROVED,"
PLATE S-2030.
(Patented—Copyrighted.)



THE "BOW" CLOSET,
PLATE S-2050.
(Patented—Copyrighted.)

"KNOCKABOUT," PLATE
S-34.
(Patented—Copyrighted.)

"COMMERCIAL,"
PLATE S-2070.
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"WINNER," PLATE
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(Patented—Copyrighted.)

"UTAH," PLATE
S-39.
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Complete line of closets, lavatories, and specialties described in NEW Catalogue "R" ready in near future, sent free on request.
Regardless of the abnormal high prices of material and labor, list prices are unchanged. Selling prices necessarily are advanced to meet conditions ranging from list prices as
net up to 50% advance over cost based upon cost of material.

A. B. SANDS & SON COMPANY

Largest Manufacturers in the World MARINE PLUMBING SPECIALISTS 22-24 Vesey St., New York, U. S. A.

1849—"SIXTY-SEVEN YEARS OF QUALITY"—1916

THE RECOGNIZED STANDARD OF THE WORLD

A COLLECTION OF LAVATORIES, PUMPS, PORT LIGHTS
AND SPECIALTIES IN STOCK FOR IMMEDIATE SHIPMENT



Plate S-150.
The "Glenwood" Folding Lavatory, with Vitre-Adamant oval basin, N. P. copper lining, N. P. brass double-acting pump, N. P. brass trimmings. Quartered oak, polished finish.....\$42.50
Mahogany, polished finish.....\$44.00



Plate S-3190.
The "Mona" 12" Vitre-Adamant Corner Lavatory; same as Plate S-3190, except with faucet, instead of pump and without trap.....\$24.50



Plate S-3193.
The "Manato" 14" Vitre-Adamant Flat Back Lavatory, with N. P. Brass Pump and waste fittings; no trap.....\$22.75

Plate S-3180.
The "Manato" Lavatory, same as Plate S-3193, except with faucet, instead of pump and with N. P. Full "B" Trap.....\$13.25

Plate S-3145.
The "Hebron" Vitre-Adamant Folding Lavatory, N. P. brass combination self-closing faucet for hot and cold water, N. P. brass waste coupling and towel rack. Complete.....\$42.50

Plate S-3380.
Small Vitre-Adamant 12" Flat Back Lavatory, with Nickel Plated Plug and Stopper, Chain and Stay, Nickel Plated Faucet, Trap, Standing Soap Dish, N. P. 730 Supply Pump. Complete as described. \$18.95



Plate S-3381.
Cast Bronze Round Raised Strainer, with self-cleaning performances. Used on water supply for any size pipe. Flange drilled for screws.....\$10.00

Plate S-3301.
Cast Bronze Round Raised Strainer, with self-cleaning performances. Used on water supply for any size pipe. Flange drilled for screws.....\$10.00

Plate S-3301.
Cast Bronze Round Raised Strainer, with self-cleaning performances. Used on water supply for any size pipe. Flange drilled for screws.....\$10.00



Plate S-208B.
The "Madison" Vitre-Adamant Lavatory in one piece, N. P. double-acting brass pump, N. P. brass full "B" trap, with waste pipe to deck. White enameled bulkhead brackets. Price: \$35.00



Plate S-1321.
Cast Bronze Heavy Pattern Inlet Connection and Scoop and Strainer
Iron Lead
1/2" Pipe.....\$2.25
1/2" Pipe.....\$2.65
1/2" Pipe.....\$2.95
1/2" Pipe.....\$3.45

Plate S-3180.
The "Madison" 12" round front Vitre-Adamant Lavatory, with N. P. Compression faucet, waste fittings and full "B" trap.....\$11.20

Plate S-5200.
Neptune Motor Boat Bow Lantern Bracket: hinges permit bracket to lie on deck when not in use. Polished Brass.....\$0.75

Plate S-5200.
Neptune Motor Boat Bow Lantern Bracket: hinges permit bracket to lie on deck when not in use. Polished Brass.....\$0.75



Plate S-207B.
The "Majestic" Lavatory, same as above except square front. Price: \$35.00



Plate S-4280.
New Pattern Improved All Brass Gasoline Pump with shut-off cock. Pol. Brass.....\$12.50
Pol. & N. P. 14.00
An efficient gasoline pump used in gallery or pantry for supply to basin or sink.

QUALITY STILL MAINTAINED

regardless of the abnormal high prices of material and labor. List prices unchanged. Selling prices necessarily are advanced to meet conditions, ranging from list prices as net up to 50% advance over list based upon cost of material.

Plate S-5000.
"Sands" New "Voluum" Bilge Pump is 20 inches high, with 2 cylinders, fitted with 5 rubber hoses. Capacity 1 gallon every 4 strokes.

Plate S-4300.
As described. \$4.50

Plate S-4301.
Same as above, but also fitted with adjustable foot rest.....\$5.00

Plate S-771.

New Style Double-Acting Brass Bilge Pump, with foot attachment and 5-ft. discharge with brass strainer.

No. 1-1/2" diam., 15" long.....\$5.00

No. 2-1/2" diam., 15" long.....\$6.50

No. 3-2" diam., 24" long.....\$14.00

With foot rest.....\$15.00

Water tight and heavy pattern

"SANDS" PORT LIGHTS and DECK PLATES



Plate S-1000.

Octagon Port Light.
Size Opening 3".....\$2.75
4".....\$3.00
5".....\$3.25
6".....\$4.00
7".....\$5.00
8".....\$6.50
9".....\$8.00
10".....\$9.50
11".....\$11.00
12".....\$12.50
13".....\$14.00
14".....\$15.50
15".....\$17.00
16".....\$19.50
17".....\$21.00
18".....\$22.50
19".....\$24.00
20".....\$25.50
21".....\$27.00
22".....\$28.50
23".....\$30.00
24".....\$31.50
25".....\$33.00
26".....\$34.50
27".....\$36.00



Plate S-1001.

Round Port Light.
Size Opening 3".....\$2.75
4".....\$3.00
5".....\$3.25
6".....\$4.00
7".....\$5.00
8".....\$6.50
9".....\$8.00
10".....\$9.50
11".....\$11.00
12".....\$12.50
13".....\$14.00
14".....\$15.50
15".....\$17.00
16".....\$19.50
17".....\$21.00
18".....\$22.50
19".....\$24.00
20".....\$25.50
21".....\$27.00
22".....\$28.50
23".....\$30.00
24".....\$31.50
25".....\$33.00
26".....\$34.50
27".....\$36.00



Plate S-1002.

Round Port Light with Heavy Frame.
Size Opening 3".....\$2.75
4".....\$3.00
5".....\$3.25
6".....\$4.00
7".....\$5.00
8".....\$6.50
9".....\$8.00
10".....\$9.50
11".....\$11.00
12".....\$12.50
13".....\$14.00
14".....\$15.50
15".....\$17.00
16".....\$19.50
17".....\$21.00
18".....\$22.50
19".....\$24.00
20".....\$25.50
21".....\$27.00
22".....\$28.50
23".....\$30.00
24".....\$31.50
25".....\$33.00
26".....\$34.50
27".....\$36.00



Plate S-1003.

Port Light with Storm Butter.
Size Opening 3".....\$2.75
4".....\$3.00
5".....\$3.25
6".....\$4.00
7".....\$5.00
8".....\$6.50
9".....\$8.00
10".....\$9.50
11".....\$11.00
12".....\$12.50
13".....\$14.00
14".....\$15.50
15".....\$17.00
16".....\$19.50
17".....\$21.00
18".....\$22.50
19".....\$24.00
20".....\$25.50
21".....\$27.00
22".....\$28.50
23".....\$30.00
24".....\$31.50
25".....\$33.00
26".....\$34.50
27".....\$36.00



Plate S-4765.

Port Light with Sleeve.
Size Opening 3".....\$2.75
4".....\$3.00
5".....\$3.25
6".....\$4.00
7".....\$5.00
8".....\$6.50
9".....\$8.00
10".....\$9.50
11".....\$11.00
12".....\$12.50
13".....\$14.00
14".....\$15.50
15".....\$17.00
16".....\$19.50
17".....\$21.00
18".....\$22.50
19".....\$24.00
20".....\$25.50
21".....\$27.00
22".....\$28.50
23".....\$30.00
24".....\$31.50
25".....\$33.00
26".....\$34.50
27".....\$36.00



Plate S-4770.

Port Light with Screen.
Size Opening 3".....\$2.75
4".....\$3.00
5".....\$3.25
6".....\$4.00
7".....\$5.00
8".....\$6.50
9".....\$8.00
10".....\$9.50
11".....\$11.00
12".....\$12.50
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16".....\$19.50
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18".....\$22.50
19".....\$24.00
20".....\$25.50
21".....\$27.00
22".....\$28.50
23".....\$30.00
24".....\$31.50
25".....\$33.00
26".....\$34.50
27".....\$36.00

STYLES S-4765 MADE IN SLEEVES 1" TO 4" LONG. ABOVE PRICES COVER SLEEVES UP TO 1 1/2" IN LENGTH; OTHER LENGTHS OF SLEEVES AT SLIGHT ADVANCE IN PRICE.

ALL SIZES 7" AND UNDER HAVE ONE CLAMPING SCREW. ALL SIZES 8" AND LARGER HAVE TWO OR MORE CLAMPING SCREWS.

Full line of ventilators, gasoline and bilge pumps, horns, whistles, strainers and outboard connections shown in New Catalogue "R." Ready in near future, free on request.

A. B. SANDS & SON COMPANY

Largest Manufacturers in the World MARINE PLUMBING SPECIALISTS 22-24 Vesey St., New York, U. S. A.
1849—"SIXTY-SEVEN YEARS OF QUALITY"—1916

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Plate S-750.
Double Acting Brass Bilge Pump, 15 inches long under spout and fitted with 5 feet of rubber hose.
No. 1-1/2" diam., 15" long.....\$5.00
No. 2-1/2" diam., 15" long.....\$6.50
No. 3-2" diam., 24" long.....\$14.00
Ring, with foot rest.....\$15.00

Plate S-770.
Double Acting Brass Bilge Pump, with foot attachment and 5-ft. discharge with brass strainer.
No. 1-1/2" diam., 15" long.....\$5.00
No. 2-1/2" diam., 15" long.....\$6.50
No. 3-2" diam., 24" long.....\$14.00
Ring, with foot rest.....\$15.00

Plate S-775.
Double Acting Brass Bilge Pump, 15 inches long under spout and fitted with 5 feet of rubber hose.
No. 1-1/2" diam., 15" long.....\$5.00
No. 2-1/2" diam., 15" long.....\$6.50
No. 3-2" diam., 24" long.....\$14.00
Ring, with foot rest.....\$15.00



FRISBIE—the Friendly Motor

The point is that cruising in a motor boat is a sport—not a trade. Here's one side of a picture: A white hull biting into lively water, a salty breeze that pulls the office ache out of your eyeballs, and makes you want to yodel like a kid on a "shoot the shoots," a good fellow or two for crew, and down in the engine room a friendly little motor with the power of twenty horses and the purring voice of a sweetheart. That's the sport. Cruising is a trade when you spend the afternoon with a monkey wrench in one hand and a wad of waste in the other, chasing the elusive spark, cursing the compression and reviling yourself for not sticking to oars.

Frisbie Motors come the closest to perpetual motion ever produced in a marine engine. They keep running. They don't fail you in a tide-way. They are built for many years of faithful service. For cruising or commercial boats their superior has never been built.

The valve-in-head design means more power, greater elasticity and less trouble than you get in the other kind. Ask us to put you in touch with Frisbie owners and learn what they think. Send for catalogue of Frisbie engines from one cylinder to six and 3 H. P. to 75.

Valve-In-

FRISBIE FOUR

20-30 H. P.

Speed, 600 to 800 R. P. M.

Minimum Speed, 150 R. P. M.

Weight, with reverse gear,

725 lbs.

Length, with reverse gear,

59 $\frac{3}{4}$ in.

Same design—30-40 H. P.
650 R. P. M.

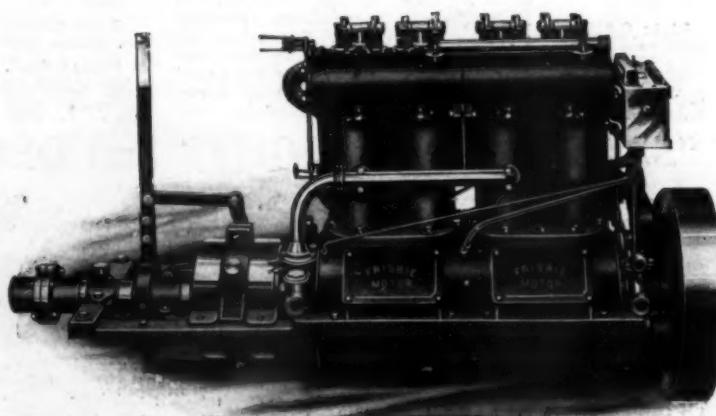
150 minimum speed.

Weight, with reverse gear,

1200 lbs.

Length over all, with gear,

72 $\frac{3}{4}$ in.





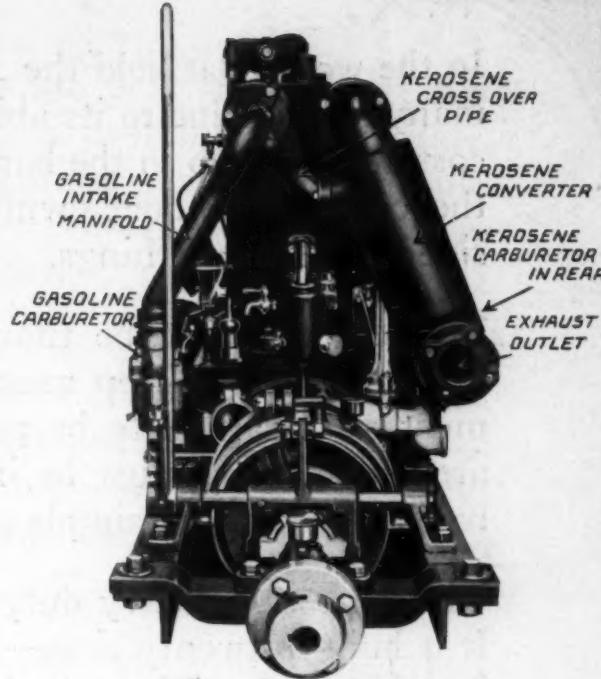
This MOTOR runs on KEROSENE

When we say that any Frisbie runs we mean just that. This Kerosene Motor runs as dependably and with 95% of the efficiency of any gas engine that ever turned a propeller. The control is flexible and there is no smoke or odor. Finally—and this is the chief advantage—it means a big saving on fuel.

The motor has two carburetors and two intake manifolds, one each for Gasoline and Kerosene—the only arrangement that produces economical results.

The motor runs well on Gasoline or Kerosene, or on a combination of the two.

Our special system of lubrication works perfectly with kerosene fuel.



End View of Frisbie Kerosene Motor,
showing the separate manifolds and
carburetors on opposite sides.

3 cyl., 18-25 H. P., 6" x 6" bore and stroke

Head Motors

This kerosene driven Frisbie is 25 H. P., 3 cyl., 6 x 6
inch bore and stroke.

It has been thoroughly tested for over two years, and
is absolutely free of experimental features.

If economy is important we recommend this type as
heartily as any gasoline driven engine we manufacture.

Write to us for full details and proof.

The Frisbie Motor Company
7 COLLEGE ST., MIDDLETOWN, CONN.



"The Automatic"

In the work boat field the *Automatic* has held the leadership for many years—due to its ability to give unfailing power at a low cost, to stand up to the hardest kind of day-after-day work. To the commercial boat owner, power and expense are to be considered above all things.

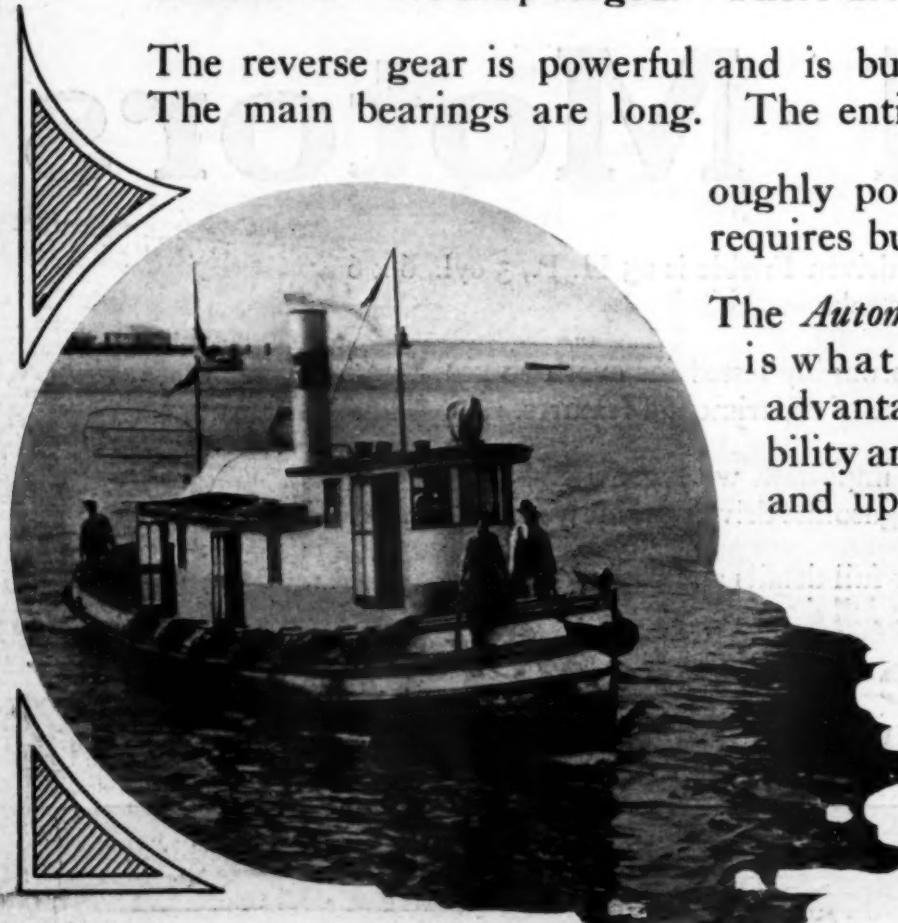
The engine must be thoroughly dependable, and the cost of operation and upkeep must be low. Repairs and replacements must be so rare as to be practically negligible, yet if new parts are needed they must be instantly available. The engine must be easy to control, simple and accessible.

The *Automatic* heavy duty engine meets all these requirements. It is built in twenty sizes—from one to six cylinders, giving from 3 to 335 H.P. The cylinders are separate and independent with removable heads. The valves are large and may be taken out without disturbing any adjustments. The crank shaft is hammered—not drop-forged. There are but few working parts.

The reverse gear is powerful and is built on the engine bed. The main bearings are long. The entire mechanism is thor-

oughly positive in its action and requires but little attention.

The *Automatic* heavy duty engine is what you need. It has the advantage of simplicity, reliability and economy of operation and upkeep. It is not an experimental engine, for it is used wherever there are motor boats. It has won the approval of all commercial boat owners. It will increase the value of your boat. Tell us what power you require.



"The Automatic"

A yacht engine? The *Automatic* is the best investment that you—a yacht owner—can make. It is a thoroughly up-to-date, enclosed engine that is suitable for the finest pleasure boat built. It is an attractive engine—remarkably powerful and smooth in action and practically free from vibration.

As for reliability: The *Automatic* is known the world over as the engine that may be depended upon under all working conditions. Year after year it has upheld this reputation—a guarantee of steady efficient service. It is also an economical engine to operate and maintain—a fact that has been demonstrated in hundreds and hundreds of boats.

The *Automatic* yacht engine is built in four and six-cylinder models ranging from 30 to 150 H.P. at 500 R.P.M. The cylinders are separate and independent, and the cylinder heads are removable. The *Automatic* is equipped throughout with bronze bearings—and these are removable and adjustable.

The lubricating system is enclosed and is thoroughly dependable. The speed of the engine is regulated by a governor which may be set at any desired point. The *Automatic* combination intake and exhaust manifold utilizes low grade fuel to the best advantage.

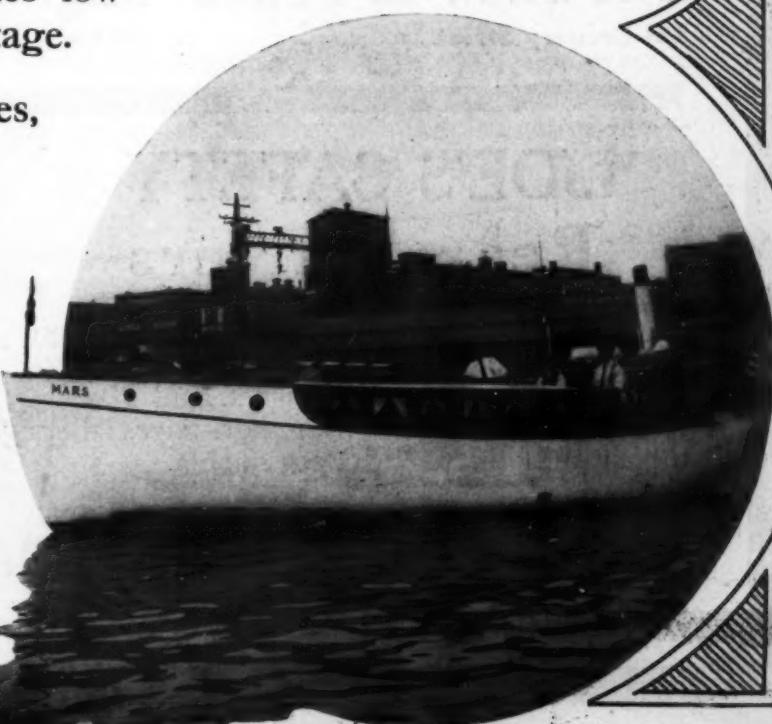
These, and many other features, make the *Automatic* a most practical yacht engine. It is clean, compact and accessible; it is easy to control and care for—a finished power plant that will satisfy the most critical owner in every respect. It is an engine designed and built to do the work as *you* require it should be done. May we submit specifications?

Write for name of nearest agent

The Automatic Machine Co.

Bridgeport

Connecticut



For YOUR boat

JOE'S REVERSE GEAR

WE build Joe's Reverse Gears and Clutches for every size and type of boat. You may have a hydroplane, launch, cruiser, or perhaps a big tug or heavy freighter; no matter which you have, we build the clutch that will give you the most service and satisfaction for your money.

Joe's Gears are known the world over. They are used in record breaking speed boats like Miss Detroit (shown below), Miss Minneapolis, and in passenger boats, commercial boats, auxiliaries, cruisers, etc. They excell in the qualities that make a good gear worth while.

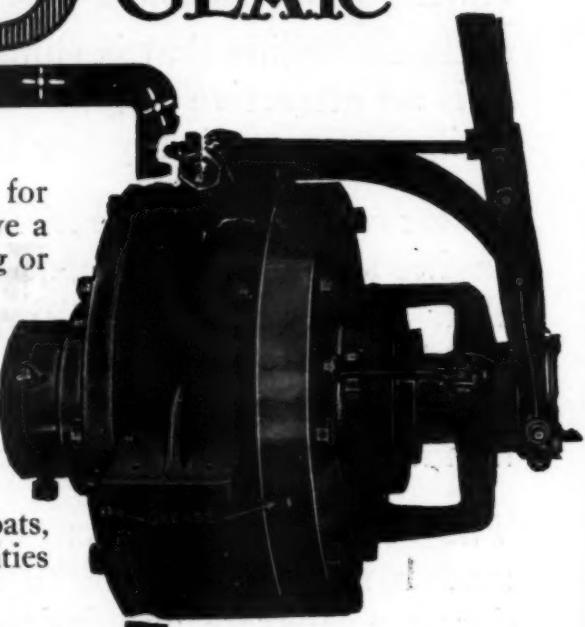
Joe's Duplex Drive is the only heavy duty gear with nearly the same speed ahead and astern that does not depend on locked gear teeth for forward drive.

Write today for latest catalog. It contains valuable information you should have before you select any gear, clutch, or starter. It is free.

The Snow & Petrelli Mfg. Co.

154 Brewery Street

New Haven, Conn.



JOE'S DUPLEX DRIVE HEAVY DUTY REVERSE GEARS.
For Heavy Boats and Racing Craft.

JOE'S FAMOUS HIGH POWER GEARS.
For High and Medium Speed.

JOE'S HIGH SPEED ONE-WAY CLUTCHES.
Especially for Hydroplanes and High Speed Propositions; Smallest Size Transmits 30 H. P. at 1,000 R. P. M.

JOE'S REGULAR ONE-WAY CLUTCHES.
A high class, low priced clutch for general uses.

JOE'S SAFETY Rear Starters

A genuine safety device and a sure protection against kick back. Mounted either on adjustable frame or bulkhead bracket, and may be attached at either end of the motor. Saves labor, money and injury. Price reasonable.

AGENTS: J. King & Co., 10 Church Row, Limehouse, E. London, Eng.; L. H. Coolidge Co., Seattle, Wash.; W. C. Disbrow, Jr., 71 Cortlandt St., New York; G. M. Josselyn & Co., San Francisco, Cal.; Wood Vallance & Leggat, Vancouver, B. C.; A. R. Williams Machinery Co., Toronto; W. D. Foreman, 1425 Michigan Ave., Chicago.



"Miss Detroit." Powered with a high-speed Sterling motor. Equipped with a Joe's Duplex Drive Gear.

WIRELESS

for Motor Boats now Practicable



Type 2A Transmitting and Receiving Set. Transmits from 100 to 800 miles, depending on conditions.

CUTTING & WASHINGTON Wireless Equipment is especially designed for motor boats and yachts. It is *quiet, simple, compact, reliable and easy to operate*. It is not a toy, but a complete and powerful outfit, superior to the bulky, noisy equipments usually installed.

Our wireless outfits quickly prove themselves indispensable to the man who wants to keep in touch with his office and home, pick up news messages and receive weather and marine obstruction reports. All this, besides protecting the lives of his guests, as some wireless equipped vessel or land station is always within easy calling distance.

The law provides that every wireless land station must receive and transmit, or forward over land lines, any message at their regular rates to or from any ship, regardless of the system employed.

Our equipment, which is manufactured by trained engineers of great technical ability and experience, is so simple and safe that any electrician can install it in one or two days.

COMPLETE EQUIPMENT READY FOR OPERATION, \$250.00 and up.

Write today for full information

CUTTING & WASHINGTON, Inc.

RADIO ENGINEERS AND MANUFACTURERS

24 Portland St., Cambridge, Mass.

Years of Faithful Service

The reverse gear that you installed in your motor boat should be more than a mere convenience in maneuvering, making landings, etc.

It should have the inherent qualities that insure long life and absolute dependability. It should respond quickly and surely to every demand placed upon it, and meet every emergency faithfully.

Baldridge
Reverse
Gear

Users tell us that their Baldridge Gear gives them a feeling of extreme confidence—that in a critical situation they feel sure that their Baldridge Gear is the one part of their equipment least likely to fail.

Years of actual service on thousands of motors have fully demonstrated Baldridge efficiency.

The one big outstanding feature of this reverse gear which immediately impresses experienced boat owners is the fact that it has

but *one* mainshaft. This extends through from bearing to bearing—it cannot possibly sag, and perfect alignment is permanently assured.

The Baldridge Gear has more than double the support usually found in reverse gears—it has double expansion clutches with reinforced reverse bands—gears heat-treated and hardened by modern scientific methods—automatic lubrication and a housing covering every moving part.

Let us give you the inside facts about reverse gears and reverse gear construction, as explained fully in the Baldridge book (free). Write for it today.

THE BALDRIDGE GEAR CO.
238 Mt. Elliott Avenue

Detroit, Mich.

"The
gear
with the
unbroken
main-
shaft"



Export Office:
47 Broadway
New York City, U. S. A.

The Baldridge Reverse Gear is standard equipment on a large number of the leading American and European marine engines. When you select an engine, ask about the Baldridge. If it is not regularly furnished with the engine you buy, ask to have it included. You can have it, if you insist.

de Forest Radio Telegraph & Telephone Apparatus

THE value of radio equipment for motor cruisers and yachts is undeniable, both for the convenience of communicating and receiving intelligence under ordinary circumstances, and for its use in emergencies. But in either case the value is entirely dependent upon the quality and reliability of the instruments and apparatus of which the equipment is composed.

de Forest Radio Apparatus is everywhere conceded to be the finest available for private use. It has been developed and refined through the persistent efforts of Dr. Lee de Forest and his staff until it has reached a degree of efficiency which cannot be expected in ordinary amateur apparatus. Used extensively by prominent yacht owners and by U. S. and foreign navies.

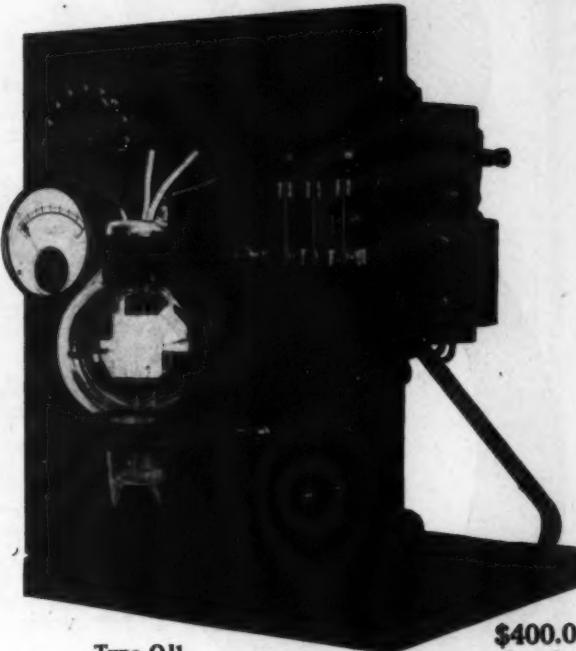
Wireless Telephones

open up a new and interesting field for the boat owner, requiring no special operator. Their perfection and practicability have been demonstrated beyond the shadow of a doubt.

Write for free Bulletins or allow us to recommend radio apparatus suitable for your requirements.

de Forest Radio Telephone & Telegraph Co.
1391 SEDGWICK AVENUE, NEW YORK CITY

Sole Makers of the Genuine Audion, Oscillion and the Highest Grade Receiving Equipment in the World.



Type OJ1

\$400.00
Complete

Oscillion Telegraph, capable of transmitting the voice 15 miles, or telegraphic messages 40 miles. Larger transmitters for greater ranges.

On October 26th a concert consisting of vocal and instrumental selections was received and reproduced by Wireless Telephone at Hotel Astor, New York City, from the recording laboratories of the Columbia Grafophone Co. de Forest apparatus was used.



A de Forest Receiving Cabinet designed especially for use on motor boats and yachts. Type RJ7—Combination ark and spark receiver with one step audion amplifier, \$225.00.



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Erd

The
New
ERD "30-40"

4 Cylinder, 4 Cycle, Valve-in-Head
Unit Power Plant

If you know the quality of the famous Erd Motors, you will be interested in the details of this new model. We frankly state that it is the finest motor we have ever built.

Crankshaft special steel, heat treated. Large bearing surfaces with interchangeable bronze backed bearings.

Connecting rods, I-beam type, drop forged. Special bronze backed bushings for connecting rods (interchangeable).

Camshaft turned from the solid bar. Cams carbonized to a depth of 1/16 inch and accurately ground.

Pistons from semi-steel (light), 3 rings to each piston. Valves, nickel steel, $\frac{3}{8}$ inch stem. Interchangeable bushings for valve stems.

Rocker arms and shafts thoroughly case hardened. Special push rod ball joint. Adjustments easily and quickly made.

Valves and push rods are completely enclosed. Covers quickly removed by two thumb nuts.

Water circulation by gear pump of ample capacity.

Oil circulating system operates by positive force feed pump, so arranged that it is impos-

sible to get out of order. Oil level indicator conveniently arranged, showing amount of oil in reservoir at all times.

Special reverse gear of ample capacity for 50 H.P. motor, connected integral with engine, making unit plant.

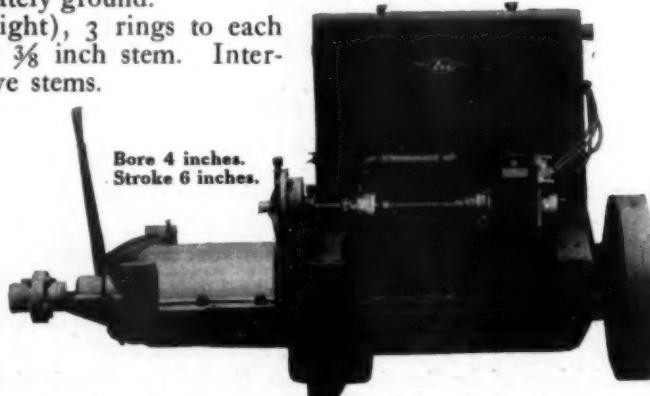
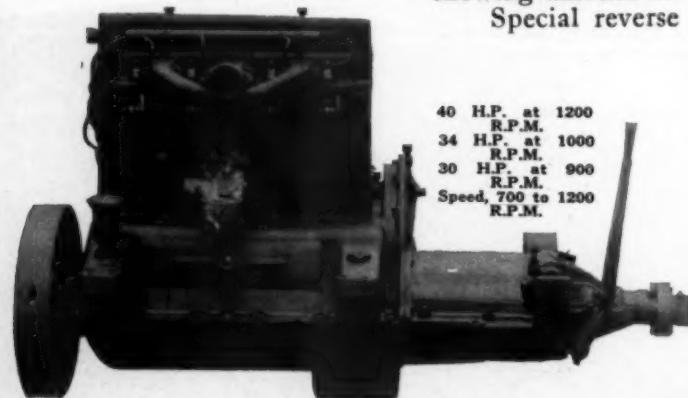
ACCESSORIES

Dixie High Tension Magneto and impulse starter—result engine starts by turning flywheel slowly.

Carburetor Special Kingston Enclosed type. Plugs, Splitdorf.

Cylinder head detachable with special indestructible copper-asbestos gasket. Flywheel 17 inches in diameter, slotted for starting bar. Weight 900 lbs.

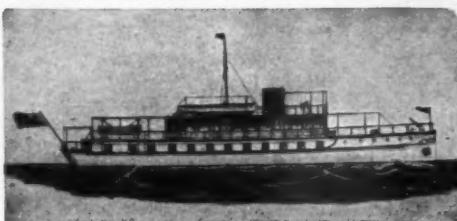
Kit of tools including cylinder head and spark plug wrench with each motor.



40 H.P. at 1200
R.P.M.
34 H.P. at 1000
R.P.M.
30 H.P. at 900
R.P.M.
Speed, 700 to 1200
R.P.M.

Write today for more complete details and prices

ERD MOTOR COMPANY, Saginaw, W. S., Michigan, U. S. A.



106-FT. CHIEFTAIN—This houseboat to be completed in January, 1917, for L. H. & A. W. Armour, Chicago.



77-FT. DORINDA—Built by us for Henry W. Savage in 1915.



95-FT. AWA—Built by us in 1912. Has shown greater speed, greater range of usefulness and greater comfort than any other houseboat of the size.



75-FT. ALELA—Built by us in 1914, for Mr. Albert Diacon, for whose father, Mr. William Diacon, we created the new type houseboat when we built the Cocopomelo in 1909.



70-FT. LANAI—Built by us and sold Winter, 1911, through Messrs. Tams, Lemoine & Crane, to Ex. Com. A. C. James, of the New York Yacht Club. Made remarkable showing for sturdiness on maiden trip, despite ice floes and ocean storms.



70-FT. CALABASH—Built by us for Mr. W. J. Matheson, New York, in 1912. Has been among the most notable boats around New York and the Chesapeake Bay ever since.

Why?

Why did such men as these—with unlimited ability to learn what is best, and to acquire it—select

Mathis-built Houseboats

L. H. & A. W. Armour, Chicago—whose 106-ft. houseboat, Chieftain, we are now building.

Jas. Deering, Chicago—whose 80-ft. houseboat, Nepenthe, we will complete in December.

Murray Guggenheim, New York—whose 106-ft. houseboat, similar in many respects to the Chieftain, we will deliver next Spring.

A. P. Ordway, New York—whose 71-ft. houseboat, Jane VI, we will complete in December.

George W. Perkins, New York—whose shallow-draft, convertible passenger-houseboat Palisades, we built.

You will see these boats and many other Mathis-built houseboats—such as the Dorinda, Awa, Alela, Lanai, Calabash, Nahmeoka II—in Florida this Winter, and along the coast or on inland bays, lakes and rivers next Spring.

Mathis Yacht Building Co.
Cooper's Point Camden, N. J.



Uncle Sam's Newest SUBMARINE M-1

Can stay under Water 72 Hours
KYANIZE WATER PROOF SPAR FINISH

Will stay under water 72 days and then come out looking new and bright without any injury to the Surface whatever.

KYANIZE WATERPROOF SPAR FINISH is put up in Triangular cans for your protection. It's the most durable exterior varnish you can get. It stands rough weather. Sun, Wind, Rain, Heat or Cold does not effect the hard, impervious surface that Kyanize imparts.

Kyanize Waterproof Spar Finish and Kyanize White Enamel are absolutely guaranteed. Money back for the empty can if not satisfactory. You will want to remember this when buying—because there is nothing just as good.

If there is no Kyanize Agent in your district, write us direct.

BOSTON VARNISH COMPANY

Fine Varnishes and Enamels

EVERETT STATION, BOSTON, MASS., U. S. A.

Chicago Warehouse and Office
510 West Twelfth Street

San Francisco Warehouse and Office
311 California Street



AFTER PHOTOGRAPH FROM UNDERWOOD & UNDERWOOD, N.Y.

Her Specifications:

Length—185 feet
Cruising speed—16 knots
Submerging speed—11 knots
Traveling radius—3500 miles
Reserve—6000
Submerging time—72 hours
Displacement—740 tons
Carries—4 torpedo tubes
Guns—One 3-inch
Periscopes—3
Horse Power—2 Diesel engines 900 h. p.; 2 electric motors 170 h. p. each
Built—Quincy, Mass.
Cost—\$620,000
Completed—1916

Kyanize
VARNISH
:WATERPROOF SPAR FINISH:

Paragon Reverse Gears

PARAGON Reverse Gears are easily the most popular high grade gears on the market today. They are almost universally used on the better class of engines and boats. There is hardly another product in this industry which is installed in so many fine motor craft, both runabouts and cruisers.

All-around efficiency is the keynote of Paragon popularity. Efficiency that embraces reliability, durability and freedom from trouble. This efficiency is the logical result of the perfected design, excellent materials and painstaking workmanship used in the construction of all Paragon Gears.

Paragon Reverse Gears are the only gears using a *direct line drive* on the reverse. The motor's power is transmitted from the engine gear *direct* to the propeller gear through four pinions, each equi-distant from the center and distributing the load *evenly*. This makes a *direct short line* for the power to travel. Thus a PARAGON will transmit more of your motor's power than is possible with any other type of construction.

The greater friction surface of the PARAGON, obtained by its original multiple disc clutch, enables the gear to hold far in excess of its rated load. It also allows you to throw your lever in gradually without throwing any sudden load on any of its parts.

When you know the whole story about Paragon Gears—how they are made—where they are used—why they are preferred—you will be ready to insist that no other gear shall be installed in your next boat.

Let us tell you the story.

PARAGON GEAR WORKS
EVANS STAMPING & PLATING CO.
CUSHMAN STREET
TAUNTON, MASS.

Paragon Yoke
Operating Type



Paragon
Speed Type



At the left is the gear that has come to be known as the Engine Builders' Pet—its installation takes up such a surprisingly small amount of room.

It is designed especially for engine builders who extend their beds to accommodate it and already has made a place for itself as a part of the regular equipment on many of the high grade motors.

At the right is the Paragon Speed Gear—designed to meet the most exacting demands of the highest grade motor builders—this type of PARAGON may well be called the gear De Luxe. It is the last word in mechanical and engineering perfection. It is powerful, compact and machined to such fine standards of accuracy that all parts are interchangeable and as near wear-proof as the use of chrome vanadium steel and modern bearing alloys can make it.

In Good Company



When writing to advertisers please mention MOTOR BOATING, the National Magazine of Motor Boating.
Advertising Index will be found on page 60.

PARAGON REVERSE GEARS

are accustomed to travelling in good company. They frequent the best clubs, mingle with the most exclusive circles, cruise in the finest boats, hobnob with the most expensive engines.

If you buy a high grade engine, more than likely you will find a Paragon Reverse Gear built in as regular equipment. But if any other gear is used, you can still secure a Paragon if you insist.

In considering an engine, don't lose sight of the importance of the gear which transmits its power. The engine may be ever so good, but if the gear doesn't hold, gives trouble or wears out before the engine, the value of the whole plant is affected.

Study the exclusive Paragon construction—in the X-Ray photograph below.

PARAGON GEAR WORKS
CUSHMAN STREET
TAUNTON, MASS.



Who Uses the Paragon

A complete list of the boats equipped with Paragon Reverse Gears would comprise a Yacht Register several times larger than any now published. It would contain the names of prominent racers, express cruisers, high speed runabouts and other boats. It is almost unnecessary to mention that quality and efficiency are the only factors that influence the selection of equipment for such boats as these.

Engine builders have opportunities and facilities for testing a reverse gear that are impossible for the average owner. It is significant that the builders of the engines which are generally considered best have almost without exception selected the reverse gear which is generally considered best—the Paragon. These gears are used by the motor builders at the right of the page.

If the engine you have selected is not in the above list, it is important that you specify a Paragon Gear when you place your order.

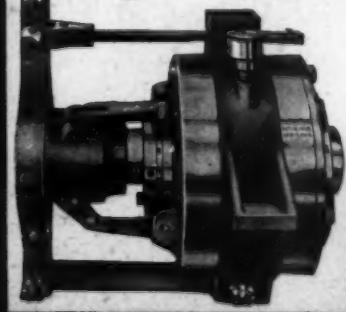
Let us send you full details. Write today.

PARAGON GEAR WORKS
EVANS STAMPING & PLATING CO.

Cushman Street

TAUNTON, MASS.

Paragon
Slide
Operating
Type



Manufacturers Using Paragon Reverse Gears

Anderson Engine Co.
Bridgeport Motor Co.
Buffalo Gasoline Motor Co.
Clay Engine Co.
Climax Engineering Co.
H. C. Doman Co.

Fairbanks-Morse & Co.
Friths Motor Co.
Fulton Manufacturing Co.
Gray Motor Co.
Hall Gas Engine Co.
Hettinger Engine Co.

Holmes Motor Co.
J. W. Lathrop Co.
Geo. Lawley & Son Corp.

Loane-Trask Engineering Co.
Mason Machine Works
Mercury Motor Co.
Mianus Motor Works
Missouri Engine Co.
Red Wing Motor Co.

Regal Gasoline Engine Co.
Remington Oil Engine Co.
Scripps Motor Co.
Sims-Daniel Motor Co.
The Standard Co.
The Stanley Co.

Tegi Motor Co.
Van Blerck Motor Co.
Vim Motor Co.
Wisconsin Motor Mfg. Co.
And Others

Paragon Agents and Service Stations

Boston—Happ-Hucking Co.
47 Havemill Street

New York—Bowler, Holmes & Hecker Co. 221 Fulton Street

Philadelphia—F. Vanderheren's Sons 7 N. Water Street

Baltimore—Unger & Mahon, Inc.

Pratt and Gay Streets

Norfolk—Gas Eng. & Boat Corp.

First Street Near Front

Jacksonville—Nat'l Boat & Engine Co. Foot of Main Street

Chicago—Geo. B. Carpenter & Co. 440 Wells Street

Portland, Ore.—The Bebe Co.

182 Morrison Street

San Francisco—Johnson & Joseph Co. 34-36 Sacramento Street

Seattle—S. V. B. Miller

72 Marion Street

Los Angeles—Marine Eng. & Supply Co.

832 So. Los Angeles Street

Houston, Tex.—Hardin Electric & Machinery Co. 111 Main St.

Cleveland—Upon Walton Co.

1294 W. Eleventh Street

Australia, Sydney—Fraser & Best

24 Bond Street



Two Big Leaders for 1917

The past four seasons have demonstrated without question the *real* superiority of L. A. Rowboat Motors.

In the hands of thousands of users, they have made good in a big way—they have proved emphatically that our idea of simple design, light weight with all complications eliminated, produce the sort of engine that buyers really appreciate.

L. A. Rowboat Motors have won out solely because they give dependability, economy, long life and simplicity at a reasonable cost.

They have plenty of power to drive heavy row-boats at a speed of six to eight miles per hour. They are extremely flexible and make ideal power for fishing boats because they can *really be run* at trolling speed.

Furnished with battery type ignition or with built-in flywheel magneto.

The L. A. 4-cycle motor meets every requirement of the man who wants thoroughly dependable power for pleasure boats or work boats from 25 to 35 feet in length.

It is designed absolutely along modern engineering lines. Compact, powerful and extremely accessible. Every moving part enclosed, yet the large hand-hole plates and removable head permit of easy access to crank-case, valves and pistons.

A thoroughbred from crank to coupling—clean in design—pleasing in appearance—and *powerful*. The four en-bloc cylinders have a bore of $3\frac{3}{4}$ inches, stroke of $4\frac{1}{2}$ inches and at 750 R.P.M. a big, honest 14 H.P. is delivered.

The Complete L-A Line

Our 1917 catalog which will be off the press shortly will give complete details of the complete L. A. line of both 2-cycle and 4-cycle motors. One, two and four-cylinder models ranging in power from $2\frac{1}{2}$ to 14 H.P. For a free copy of this valuable book on engines, address

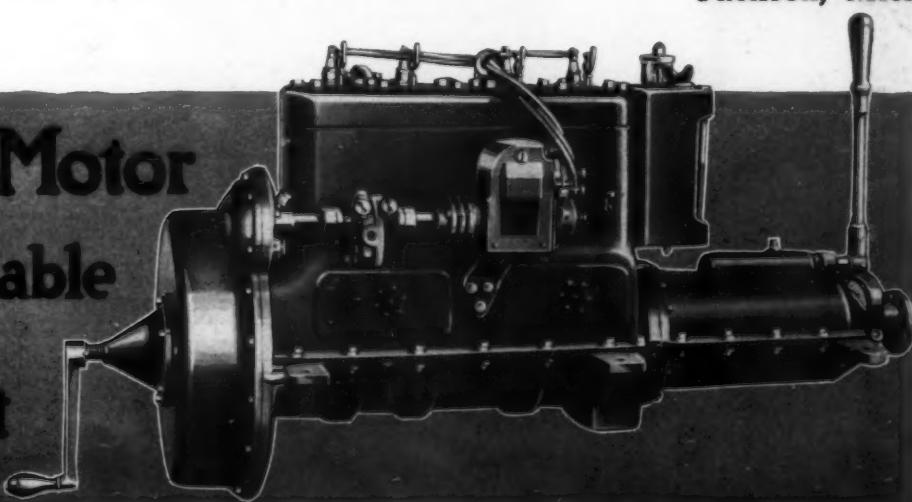
LOCKWOOD-ASH MOTOR CO.

1301 Horton Avenue

Jackson, Mich.

L-A 4 Cycle Motor

**Sturdy Dependable
Power in a
Compact Unit**



Since 1868, CROCKETT'S VARNISHES



Use Them On Your Boat

Nowhere else is it quite so true that the best is the cheapest in the long run. Crockett's Marine Varnish Specialties have been recognized for two score and eight years as the best on the market.

Crockett's Spar [Composition]

The best known and most durable spar varnish ever made. It will not spot, crack, blister, scale or turn white under the severest exposure. Absolutely unaffected by fresh or salt water.

No. 1 Preservative

The perfect interior finish for boats, yachts and steamships. Not harmed by hot water and soap.

Waterproof Floor Finish

The perfect floor varnish for marine use.

Write today for copy of our valuable booklet, "What to Use and How to Use It." Gives many important suggestions for the selection and application of varnishes for different purposes. Sent free on request.

The David B. Crockett Co.

Varnish Makers Since 1868

BRIDGEPORT

CONNECTICUT

EDYL

Long Distance Champion

of the East



RALACO
THE SILENT SIMPLIFIED ENGINE

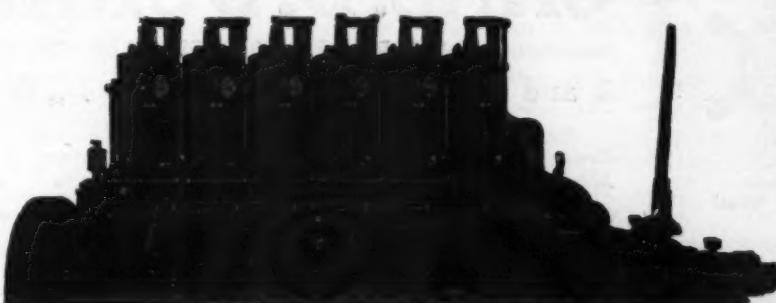
Edyl is the kind of a boat we are proud to say is equipped with a Ralaco engine. A common-sense comfortable boat,—quiet, unassuming, and more reliable than any speed boat ever built.

Edyl won every important long distance cruiser race of the year in the East. She won the A. P. B. A. Certificate awarded for the Handicap Cruiser Championship of the Hudson River, and a similar certificate for the championship of Long Island Sound.

Ralaco Engines are the most economical power plants ever built. They are guaranteed to develop their rated power on one-tenth of a gallon of fuel per horse power per hour. A 10 H.P. will run one hour on one gallon of gasoline or less. Most Ralacos use less than the guaranteed fuel consumption.

For economy, durability and reliability, Ralaco Engines have no competition. One to seventy-five horse power. Four-cycle heavy duty type.

In the 270-mile New York to Albany and Return Race, Edyl consumed just 29 gallons of gasoline. The boat which established the express cruiser record for this race consumed *nearly ten times as many gallons of fuel*. Edyl has a 2-cyl. 8-10 H.P. Ralaco engine.



The Six Cylinder 7 x 9" Ralaco Engine.

Write today for catalog.

**The S. M. Jones Company, 616 Segur Ave.
TOLEDO, OHIO**



Triplex Stern Light



Durkee Patent Lock Deck Plate



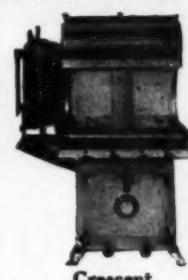
Patterson Trap Ventilator



Pyro Alcohol Stove



Pyro Alcohol Stove With Tank



Crescent Yacht Range



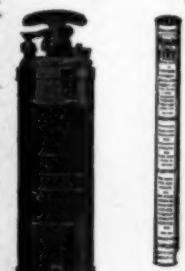
Thief Proof Gasoline Filling Caps for Tanks



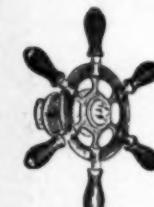
Durkee Pattern Port Light



Brass Strainer



"Reliable" Chemical and "Anchor" Dry Fire Extinguishers



Durkee Launch Wheel



Crescent Ball-Bearing Anchor

HARDWARE FOR WET PLACES

WE SHOW IN THIS BORDER A FEW,
OF THE MANY THINGS WE MAKE.

ASK YOUR
DEALER
FOR



DURKEE'S
RELIABLE
HARDWARE

Are you acquainted with the TWO
SPECIALS DESCRIBED BELOW?

EELLS STOCKLESS ANCHOR

"The Anchor with the Bull-Dog Grip"

Holds in any bottom. Will stand double the strain of any anchor of same weight. Reduces weight of anchor one-half. Made from 5-lbs. to 10 tons.

Impossible to foul when lying at anchor. Has stood more tests than any other anchor on the market, and it costs you less money. Send for circular.



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Enables you to remain under water for hours and make repairs with absolute safety. Takes 20 seconds to get a man overboard and working. Nothing to learn to work proficiently.

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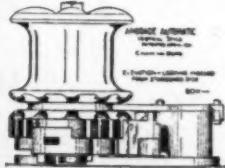
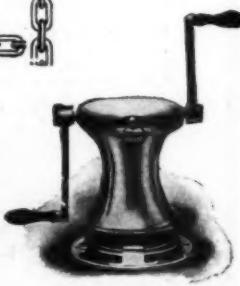
Our 1,100-page catalogue sent on receipt of 25 cents to cover delivery, or through your dealer free.



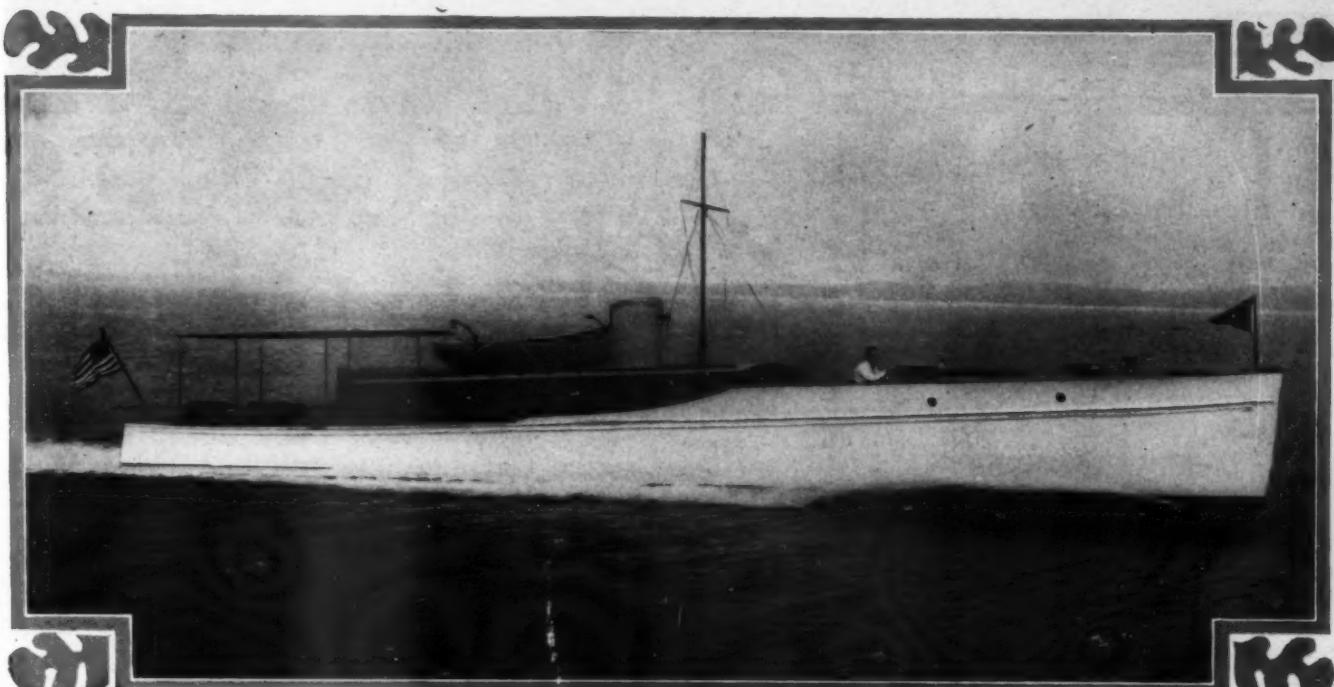
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Style No. 5
To handle one chain and one rope

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COSSACK—64x9-ft. raised deck cruiser. Owned by Mr. G. L. Stone, Boston, Mass.

If You Get a LAWLEY BOAT



COUNTESS—40x9-ft. V-bottom express cruiser. Champion of 1916. Owned by Mr. Wm. H. Hand, Jr., New Bedford, Mass.



LYNX—48x10-ft. Patrol Squadron Cruiser. Owned by Mr. N. F. Ayer, Boston, Mass.



GOVERNMENT PATROL BOAT—45x10 ft. Built for U. S. Navy Department

If you get a Lawley-built boat, whether it be a tender, runabout, cruiser or a large ocean-going yacht, you will be absolutely assured of receiving

Entire satisfaction in all respects.

The finest selection of the materials you specify.

The highest grade of workmanship throughout.

The slowest depreciation of your investment.

The highest price when you sell it.

The greatest durability in unsparing service.

For fifty years we have confined our efforts to building motor boats and yachts of the highest grade, and have refused to build any other kind. As a consequence the words "Lawley-built" have a value comparable to the Sterling mark on silver.

It is only logical to assume that, with the most extensive experience, the largest, best organized, most completely equipped plant, a reputation for quality which we have every reason to protect, we give any prospective boat buyer a little better boat than any other builder in the country.

We build tenders, motors boats, life boats, cruisers, auxiliaries and yachts of all types. Wood, steel, bronze or composite construction. Steam power plants.

Write today for the illustrated Lawley Booklet.

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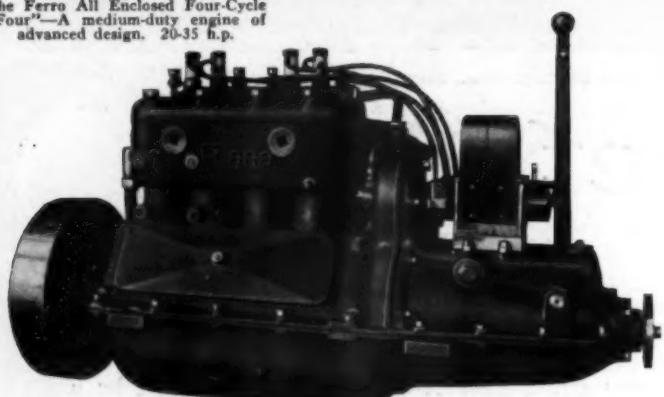
Established 1866

NEPONSET, MASS., U. S. A.

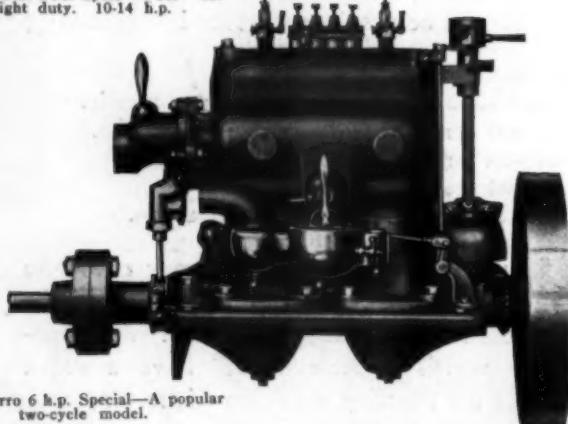
Cable Address "Lawley Boston"



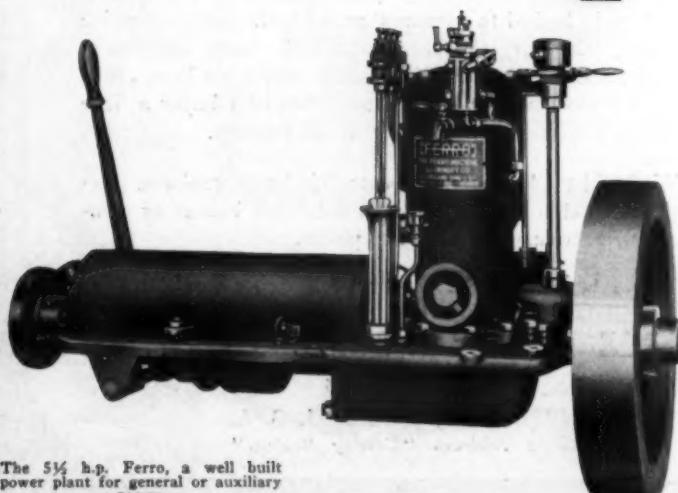
The Ferro All Enclosed Four-Cycle "Four"—A medium-duty engine of advanced design. 20-35 h.p.



The Ferro Four-Cycle "Four" for light duty. 10-14 h.p.



The Ferro 6 h.p. Special—A popular two-cycle model.



The 5 1/4 h.p. Ferro, a well built power plant for general or auxiliary power.

MARINE ENGINES

Under Every Flag

Wherever you go, whether it be to Iceland or the South Seas, to the Cornish Coast or the Caribbean, you'll find Ferro Marine Engines.

During the past year Ferro Engines were again shipped to every part of the globe. They went to practically every South and Central American country, to Europe, Africa, Asia, to the Antipodes, to the West Indies. Some went to Borneo, others to the Fiji Islands, some to Siberia, others to Siam.

Such widespread use of Ferro Engines bears testimony not only to their quality but to the variety of the line and the character and extent of Ferro service.

15 Models—Two-Cycle and Four-Cycle

The Ferro line consists of three four-cycle engines, from 10 to 50 h.p., eleven two-cycle models, from 3 to 25 h.p., and the Ferro Rowboat Motor. Specifications are:

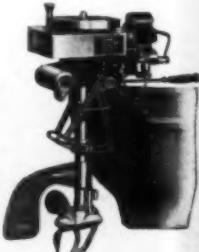
Model	Cylinders	Bore and Stroke	R.P.M.
Four-Cycle			
20-35 h.p.	4	4 by 6 in.	700-1000
35-50 h.p.	6	4 by 6 in.	700-1000
10-14 h.p.	4	2 3/4 by 4 in.	1000-1400
Two Cycle			
3 h.p. special	1	3 1/2 by 3 1/4 in.	700-900
6 h.p. special	2	3 1/2 by 3 1/2 in.	700-900
4 h.p.	1	3 1/2 by 3 1/2 in.	600-800
5 1/2 h.p.	1	4 1/4 by 4 1/4 in.	600-800
7 1/2 h.p.	1	5 by 5 in.	550-800
8 h.p.	2	3 1/4 by 3 1/2 in.	600-800
11 h.p.	2	4 1/4 by 4 1/4 in.	600-800
15 h.p.	2	5 by 5 in.	550-800
12 h.p.	3	3 1/4 by 3 1/2 in.	600-800
17 h.p.	3	4 1/4 by 4 1/4 in.	600-800
25 h.p.	3	5 by 5 in.	550-800
Rowboat Motor 2 1/2 h.p.	1	2 5/8 by 2 5/8 in.	900-1100

All Ferro Two-Cycle Engines can be equipped to burn kerosene instead of gasoline.

Write for Marine Engine catalog and state type of engine that interests you.

Make a Motorboat of Your Rowboat

It's easily done with the Ferro Detachable Motor. Quickly attached and detached. Travels at any speed from 2 to 9 miles an hour. Runs five hours on a gallon of gasoline. Reliable, easy to start, simple to operate. Ask for Rowboat Motor catalog.



The Ferro Machine & Foundry Company
1210 Hubbard Avenue
Cleveland, Ohio



WE ARE PROUD OF "FALCON"

We are almost as proud of this cup winner "Falcon" as her owner, Mr. George L. Leonhard, of the Paterson Parchment Paper Company, Passaic, N. J. Mr. Leonhard is proud because he owns the finest family speed boat on Lake Hopatcong. We are proud because Falcon is one of our standard Fay & Bowen 30 ft. raised deck runabouts, powered with a

FAY & BOWEN ENGINE

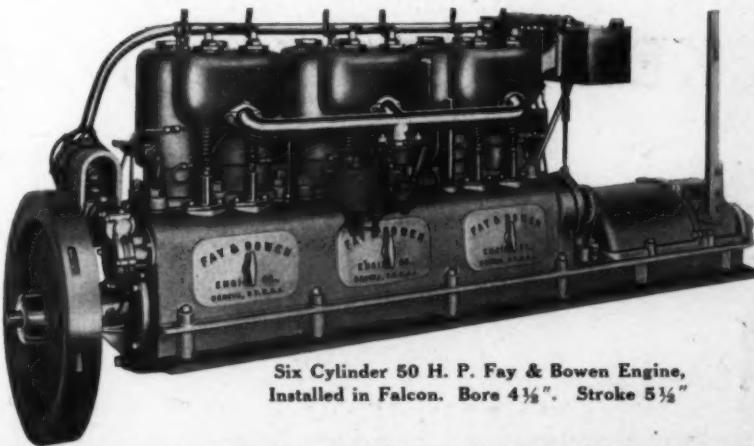
In a series of six races this boat won three, one of them a 50-mile race for the silver cup shown above. In a long letter about his satisfaction with Falcon, Mr. Leonhard said:

"In regard to the 50-mile race she ran perfectly, without a hitch for the whole distance. When we came in at the finish the people at the yacht club were surprised to see the machinery in such good shape after such a run, showing no marks of a hard race whatever, not being heated up any more than it would be after an ordinary run of five or ten miles."

If you want a comfortable family runabout that is fast enough and reliable enough to be the champion of her class in your club, you will be interested in Falcon. The boat is 30 x 5½, smooth running and dry, handsome in appearance, roomy without being "tubby," well built, beautifully finished and completely equipped. Speed, 20 miles an hour with a six-cylinder 50 H.P. Fay & Bowen Engine.

We build other sizes of engines and boats, also independent electric lighting units, pumping sets, etc. "None Better Built."

Write for literature.



Six Cylinder 50 H. P. Fay & Bowen Engine,
Installed in Falcon. Bore 4½". Stroke 5½"

FAY & BOWEN ENGINE COMPANY

104 LAKE STREET, GENEVA, N. Y., U. S. A.

New York Office: 50 Church St., on Concourse, Sutter Bros., Representatives.

Made for Canada by the St. Lawrence Engine Co., Ltd., Brockville, Ont.



FRIENDS

The Election Is Over—

Half of us had our way. The other half didn't. But business is fine in spite of it all. Prices are going up on engines. After the first of the year you can at least have your own way in ordering your marine engine. Open your eyes. Figure ahead. Save money. We can't hold our prices down. Materials are advancing daily. Orders placed now are filled at present prices for future delivery. When deliveries start on 1917 materials, about Jan. 1st or Feb. 1st, the advance will take place. We can't promise exactly what it will be at this time, but—it will be enough.

Make Your Dollars Have More Cents

We have arranged things so that you can get the most for your money in buying a marine engine, and for Heaven's sake, don't blame us if you ever feel sorry you didn't buy a Kermath. Our catalogs are waiting for your request, and asking for one incurs no obligation.

The catalog does tell all about Kermaths and—just perhaps there is something there that you don't know. Seems funny, don't it, that we don't know it all. But it's the wise man that searches around, gets information, and selects the best, that gets the most out of life.

If you buy motors and don't know the Kermath, wake up.

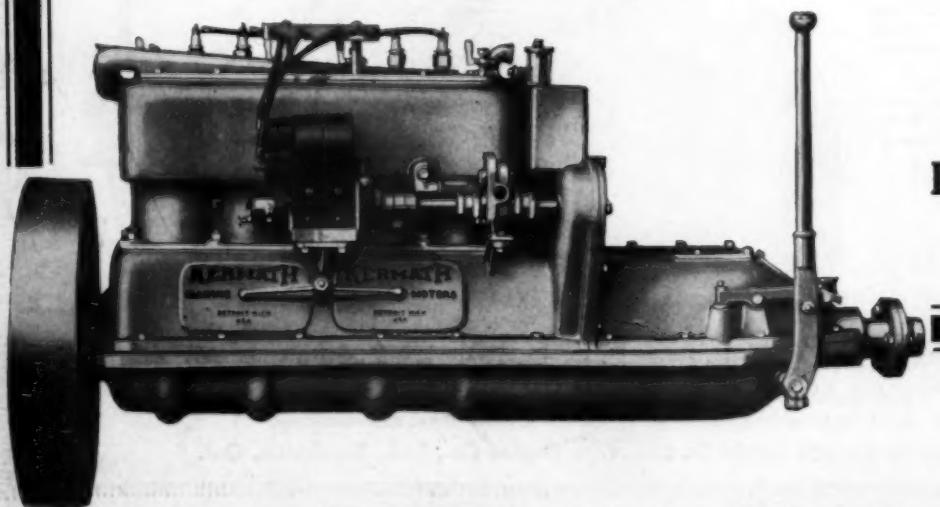
Get posted about where your "dollars have more cents" and can buy more real service and value than others can offer.

Have your own way, but get all the information you can before putting your good money into a marine engine.

Four Cycle Four Cylinder

12-16-20 Horse Power - - - \$195.00 to \$375.00

KERMATH MANUFACTURING CO.



Dept. 2

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